Development of a Strategic Framework for Information Technology Implementation in Libyan Airports

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DECLARATION

Statement of Originality

This thesis is submitted to University of Salford in fulfilment of the requirements of the degree of Master of Philosophy. This thesis represents my own original work towards this research degree and contains no material which has been previously submitted for a degree or diploma at this University or any other institution, except where due acknowledgement is made.

Signature of candidate…….

Date: 16 November 2015

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DEDICATION

Dedicated to:

My mother, Allah blesses her soul who loves to see me at this stage of my education.

My father, Allah gives him the strength to see me wear the graduation crown.

My wife, who has always supportive of all my endeavours

My children, I am sorry that sometimes I wasn't there for you.

The Abbreviations

ACI	Airports Council International
ACRP	Airport Cooperative Research Programme.
ADM	Airport Data Monitoring
ADSL	Asymmetric digital subscriber line
ASI	Airport Systems Integration
ASIC	Application specific integrated circuit
ASP	Application service provider
BEN	Benghazi
BPC	Basic People's Congress
CAD	Computer-aided Design
CAPA	California Alternate Performance Assessment
CASE	Computer aided software engineering
CIA	Central Intelligence Agency
CITIAs	Circuital IT Implementation Areas
CM	Change Management
CRM	Customer Relationship Management
CSF	Critical Success Factor
CTIAs	Circuital Technology Implementation Areas
DSL	Digital subscriber line

E&E	Electronics and electrical engineering (industry)
EDI	Electronic Data Interchange
ERP	Enterprise resource planning
EU	European Union
FDI	Foreign direct investment
GDP	Gross domestic product
GECOL	General Electrical Company of Libya
GMT	Greenwich Mean Time
GSM	Global system for mobile communication
HLLB	Benghazi/Benina Airport Information
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
ICT	Information Communication Technology
IM	Information Management
IP	Internet protocol
IRS	Internal Revenue Service
IS	Information System
ISO	International Standardisation Organisation
ISP	Internet service provider
IST	Internet software technology
IT	Information Technology

ITIFLA	IT Implementation Framework for Libyan Airports
ITS	Information Technology Strategy
ITT	Information Technology Technician
KM	Knowledge Management
LAA	Libyan Air Airline
LAN	Local area network
LCCA	Libyan Civil Aviation Authority
LFIB	Libyan Foreign Investment Board
LY	Libya
LYCCA	Libyan Civil Aviation Authority
LYD	Libyan Currency (Dinar)
MENA	Middle East and North Africa
NTC	National Transitional Council
OAG	Official Airline Guide
OC	Organisational Commitments
OCL	Organisational Culture
OL	Organisational Learning
PDM	Product Data Management
R&D	Research & Devolvement
RGEC	Research Governance and Ethics Committee
SMC	Senior Management Commitments TA
TA	Technology Assessment

TAM	Technology Acceptance Model
TI	Technology Intelligence
TIP	Tripoli
TM	Technology Monitoring
TMP	Technology Management Processes
TRM	Technology Road Mapping
TW	TEAMWORK
UN	United Nations
WAN	Wide Area Network
WTO	World Trade Organisation
WWW	World Wide Web

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ABSTRACT

This study aims to establish the key factors that will encourage the Libyan government, through the Libyan Civil Aviation Authority, to expand their activities to upgrade Libyan airports' technology in general and its IT departments in particular. A number of objectives were formulated in order to achieve this aim and two case study organisations were chosen to represent Libyan airports as a whole. Modern day IT implementation poses numerous difficulties which, when surmounted, brings a lot of benefits and can help speed up processes as well as prevent or mitigate the effects of risks. However, organisations feel overwhelmed by the complexity of IT management and they sometimes fail to assess the costs of associated risks.

Therefore, they are usually reluctant to invest in IT solutions that may be untested or unsuitable to their environments. As a result, IT implementation system processes can be misaligned. This thesis examines the benefits of IT strategic alignment in IT implementation to promote the use of IT and to realise the value thereof. This research has identified the alignment of IT and the current barriers to the special needs of this area. Application of IT in the aviation industry in general, and in airports in particular, should recognise and deal with some of the factors, both expected and the unexpected, to implement a successful programme for IT. Therefore, this research proposes methods and conceptual models based on modern IT frameworks that will help IT implementation in organisations to align IT initiatives with the objectives of IT systems. The researcher used qualitative, quantitative and modelling techniques during the various stages of the research. IT facilitates inter-airport relations and the transfer of responsibility through the coordination of IT implementation systems in all airport departments by aligning IT initiatives with implementation units and IT organisations that work with government committees. The implementation of standardised and advanced IT systems will cause management organisations to appreciate high level standards in IT initiatives for the benefit of their management, staff and their customers (passengers).

Chapter 1

Introduction

1.0 Introduction

This research explores the implementation of information and technology at Libyan airports and recommends strategies for the improvement of IT implementation in this area. The thesis is organised as follows: firstly it provides an introduction on the subject. It then presents the main aspects of the research's background, namely a literature review, the research aim and objectives, the research questions, its anticipated contribution to knowledge, its scope, and the methodology used to achieve its goals.

It is almost axiomatic of airports' IT management systems that a task may be regarded as being successful if it goes smoothly and on time, and is of the desired quality. And, in particular, the many different departments and professions that are commonly involved in the process.

Information technology generates fundamental changes in the nature and application of technology in business. Information Communication Technologies (ICTs) can provide powerful strategic and tactical tools for organizations which, if properly applied and used, can bring about great advantages in promoting and strengthening their competitiveness (Porter, 2001).

The world's aviation industry (including airlines, airports and other facets of the sector) is extremely important in all parts of the world. Other sectors (such as tourism) in turn are vitally dependent on air transportation. Businesses and the public use air travel and air cargo as a key part of their activities. Airports and airlines (aviation) are some of the most interdependent organizations in the travel industry. Therefore, they need to use technology strategically to integrate their operations and control and co-ordinate all their business and management functions.

Realistic IT innovation time is now increasingly of the essence because it often serves as a crucial benchmark for assessing the performance of a project and the efficiency of a project's organisation. A fundamental specification of information technology is the project period or the time of project execution which is established prior to any bidding. The successful execution of projects and keeping them within estimated costs and prescribed schedules depends on a methodology that requires sound engineering judgment (Kaliba et al., 2009; Hancher, 1981).

Aviation today signifies business. Commerce and tourism are the engines of economic development in today's world. Airlines, airports, and even governments, compete against each other for travel related income. Staying in front means making investments in enhanced customer service tools, improved management awareness, quicker access to operational information, etc. All the technology and service options available, and the need to make rapid, well-informed decisions, means that many organizations are finding it increasingly difficult, and expensive, to find and retain staff to meet demands. Unlike many consultants and developers already understand much of the situation because they have been there before. Information systems' technology has over 100 years of combined experience in aviation management and technology. (www.insyte.com).

In providing guidance and assistance to management in planning, developing and implementing the technical infrastructure necessary to compete in today's climate. However, there is more to it than simply selecting and applying technology. It also requires knowledge and insight into the proper application of technology. 'Proper application' requires an understanding of how the technology fits the organization; how it affects, and is affected by, the users, staff and management; what its limitations are and what restraints it imposes on the future... *in short, what are the business implications?* (ibid).

1.1 Strategies for IT Implementation.

The connection between strategy and IT has not been clearly articulated with respect to a finite set of concepts, an analytical framework and normative prescriptions. The strategic role of IT, from a manufacturing perspective, can be referred to as 'technology push' (Morton, 1990). Two issues deserve special mention; one is cost-performance trends and the second is connectivity capabilities. Rapid advances in the various components of IT have resulted in continuous improvements in price performance ratio in recent years. Analogous to manufacturing strategy, IT strategy is conceptualized in terms of structure and infrastructure. Decisions of a structural nature contain three dimensions:

(1) *System competences*.

(2) *Technology scope.*

(3) *IT alliance.*

(Ho, Chin-Fu,1993).

Sashittal & Wilemon in Monzavi et al., (2013) have pointed out that some terms synonymous with "implementation", such as "execution", and "actualization of goals", are often employed in management literature but are not frequently used by managers themselves.

Hrebiniak (2006) noted, for example, "Formulating strategy is difficult. Making strategy work – executing or implementing it throughout the organization – is even more difficult". (cited in Schaap, 2006). Consequently, this thesis will not distinguish strategy implementation from execution. The thesis will use the former term as the descriptive domain label as it is more widely used in the relevant literature.

1.2 Concept of Technology.

Schon (1967) defined technology as any "tool or technique, any product or process, any physical equipment or method of doing or making, by which human capability is extended". Technology may be defined as the application of an existing body of knowledge to the production of goods and services (Ofori, 1994). Technology also includes both hardware (such as machinery and equipment) and software (such as skills and knowledge) (Alzavian, 2007). A further listing Of technology components is given by Ramanathan (1994) and Sharif (1994) who identified four components of technology which are Techno ware, Human ware, Info ware and Orga ware. It can be said that all components of technology are required in order to facilitate effective technology transfer. Human ware is the centre of all these components and embraces all the required skills, knowledge and experience to use equipment and machines (Techno ware). Info ware is required to facilitate the process of technology and Orga ware is required to allow all the components to come together in the same environment.

1.3 The Aviation Sector.

Aviation is broadly grouped into three classes: general aviation, air transport aviation and military aviation. General aviation comprises all aviation not included in military or air-transport aviation. Military aviation includes all forms of aviation used in military activities and air-transport aviation is primarily the operation of commercial airlines essentially as a public utility for the movement of persons and commodities.

There are numerous jobs that are created by the airline & airport industry which are not involved in aviation at all but which would not exist without the airline and airport industry. These include jobs in sightseeing/tourism, hotels and restaurants. This is not only for the passengers but also for the vast amount of airport employees (Cowper-Smith & de Grosbois, 2011; Henderson, 1999).

Civil aviation refers to planes of any kind any size that is non-military. Furthermore, aviation comprises everything to do with planes such as airports and airlines any kind (flag carriers, commercial, charter, cargo), control towers, runways, passengers, personnel (pilots, flight & ground engineers, all the staff in airlines and airports), any additional concerns belonging to airports or/and airlines including hotels, parking spaces, bus and train stations, taxis. Airports are vital national resources. They serve a key role in transportation of people and goods and in regional, national and international commerce. They are where a nation's aviation system connects with other modes of transportation and where federal responsibility for managing and regulating air traffic operations intersects with the role of state and local governments that own and operate most airports.

Research is necessary to solve common operating problems, to adopt appropriate new technologies from other industries and to introduce innovations into the airport industry. The Airport Cooperative Research Programme (ACRP) (1) serves as one of the principal means by which the airport industry can develop innovative near-term solutions to meet the demands placed on it. Airport administrators, engineers and researchers often face problems for which information already exists, either in documented form or as undocumented experience and practice. This information may be fragmented, scattered and unevaluated. As a consequence, full knowledge of what has been learned about a problem may not be brought to bear on its solution. Costly research findings may go unused, valuable experience may be overlooked, and due consideration may not be given to recommended practices for solving or alleviating a problem.

There is information on nearly every subject of concern to the airport industry. Much of it derives from research or from the work of practitioners faced with problems in their day-to-day work. To provide a systematic means for assembling and evaluating such useful information and to make it available to the entire airport community.

Figure 1-1: A typical bird's eye view of an airport (illustrating many aspects of the aviation sector)

(1)Airport Cooperative Research Program (ACRP)

The Airport Cooperative Research Program (ACRP) is an industry-driven, applied research program that develops near-term, practical solutions to problems faced by airport operators. ACRP is managed by the Transportation Research Board (TRB) of the National Academies and sponsored by the Federal Aviation Administration (FAA). The research is conducted by contractors who are selected on the basis of competitive proposals.

TRB Transportation Research Board http://www.trb.org/Main/Home.aspx 15:00 ON 12-11-12

1.3.1 Information Technology Challenge in Libyan Airports.

In any business, information technology is of extreme importance. Information is business and without information no business can be successful. A successful businessman always analyses all information which is relevant to his

business for arriving at decisions to maximize his profits. In the fast growing age of information technology where information stored on millions of servers the world over is available on a desktop at the click of a button, knowing where to find information and how to use the information has become more important that the information itself.

1.3.2 IT System used in case study airport

The problem at Tripoli Airport is that there is a low level of IT (as IT activities understood level 1 in the frame work (levels of IT) shown later in this thesis). This is due to the following reasons:

- Small IT Department at the airport.
- There is an IT Section sub-department.
- There is a lack of sharing IT knowledge.

The different levels of IT use are outlined below based on their intensity and relevance in the sector and the industry generally:

5- Integrated- IT plays a vital role in business activities and is integrated with clients and with business IT systems.

4- Strategic - The business employs IT as part of an overall business strategy. IT is used to analyse and improve business activities.

3- Planned - The business has a programmer for IT investment and implementation. IT supports business activities and tends to be working satisfactorily.

2- Responsive- IT implementation is governed by competitors or by purchasing software upgrades from software vendors. IT is used primarily when asked for by clients and partners.

1- Occasional- The business has a limited understanding of the value

and potential of IT. It is dependent upon individuals buying hardware and software for their own needs.

0- Not Used - The business does not use IT to support its activities.

Because the researcher worked in Tripoli airport as volunteer in demonstration management after the Libyan council temporary committee take over Geddafe's regime and the researcher notes that the Tripoli airport does not have a complete system for information management and no IT implementation strategy. It also does not meet the requirements of any international organization standards in its IT management system because of:

- Poor communication between airport departments.
- Poor communication between employees from the lower levels to top levels and vice versa.
- Fragmented communication between the departments which does not allow for efficient information sharing and exchange.

1.3.3 Barriers and issues relating to IT implementation.

Why are barriers important?

A barrier is an obstacle which prevents a given policy instrument from being implemented, or limits the way in which it can be implemented. In extreme cases, such barriers may lead to certain policy instruments being overlooked and the resulting strategies being much less effective. For example, demand management measures are likely to be important in any industry as ways of controlling the growth of congestion and improving the environment but, at the same time, they are often unpopular and hence people may be tempted to reject them simply because they are unpopular. If such a decision leads, in turn, to greater congestion and to a worse environment, such a strategy is less successful. The emphasis should therefore be on how to overcome these barriers, rather than on simply how to avoid them.

What are the principal barriers?

This study groups barriers into the four categories listed below. The process of strategy development can also impose a barrier to effective planning.

1) Practical and technological barriers.

2) Financial barriers

3) Political and cultural barriers

4) Legal and institutional barriers

Piccoli and Ives (2005) have created a framework based on previous research that shed light on how strategic IT-investments impact the competitive advantage of a company (see Table 1-1). Their conclusion is that there is an appreciable possibility to use IT investments to gain competitive advantage. The framework identifies four barriers that need to be crossed to achieve competitive advantage with the help of IT.

The first is the *IT resource barrier* which implies that a company with superior IT resources can gain competitive advantage in a way that cannot be replicated by a company with less superior IT resources.

The second barrier is the *complementary resource barrier* and is similar to the first one, although now the non-technical resources are in question; personnel, organizational attributes etc. The third barrier, the *IT project barrier*, implies that the more time consuming, expensive, and complicated the implementation project is the higher is this barrier to gaining competitive advantage. The last barrier is the *pre-emption barrier*; competitive advantage can't be achieved if successfully imitating a competitor since this competitor holds the position of the leader and hence, has a sort of power to preempt the access to customers. (Piccoli & Ives 2005)

IT Resource Barrier	
Complementary Resource Barrier	
IT project barrier	
Pre-emption barrier	

Table 1.1 Four barriers that need to be crossed in order to achieve competitive advantage through IT investments (source: Piccoli & Ives 2005)

Piccoli and Ives (2005) further identify three important areas that need to be focused on to gain competitive advantage. These are efficiency improvements, differentiation, and channel domination.

This is, according to the authors, a widely accepted conclusion in the research on this field. And hence, it can be concluded that it indeed is possible to gain competitive advantage with the help of information systems and IT in general. It is just a matter of doing things right.

1.4 Rationale for the research.

The fundamental principle for this research is to link theory to practice, thus driving the development of new approaches to showing and then to implementation (Cambridge Research Institute).

1.4.1 Motivation for the Study.

The Libyan aviation industry is rapidly falling behind the rest of the world particularly in the field of applying IT approaches. Possible reasons for this include: a lack of awareness and a poor knowledge of standards and quality, an absence of performance measures, local standards which are often incomplete or are incompatible with international standards, a shortage of skilled managers and a very limited implementation of quality management tools or other quality techniques (such as process management, policy deployment, benchmarking, self-assessment or quality function deployment), a lack of expertise in identifying

target consumers and attracting them to buy products, and a lack of government initiatives to promote quality within Libyan society.

Today, because of the pressure of globalisation from the World Trade Organization (WTO) and the opening up of the country to international competition, Libya, as a country (and Libyan companies specifically), is facing severe international competition. If something is not done soon to improve quality standards in Libyan organisations then Libyan industry will inevitably suffer.

1.4.2 Personal Motivation.

The researcher (being part of aforementioned Libyan industrial culture) has witnessed the waste of expensive resources, the failure of major and minor development plans, and human resources as an agent for change being ignored. Libyan industries have continued in the loop of a vicious circle whereas poorer developing countries have made radical changes and have become developed countries that can compete in the global arena for a better quality of life. Building on research findings and taking into consideration other countries' experiences the researcher will try to develop a simple practical model for the implementation and maintenance of an ICT strategy within Libyan airports. The researcher believes that such a strategy would help Libyan managers make significant changes in their management philosophy, attitudes and behaviour.

1.4.3 Filling in the IT Gap at Libyan Airports.

Alshawi (2007) has talked about performance analysis and has stated that one of the most commonly used techniques for business improvement is gap analysis. This technique is based on two performance levels – current and target. In addition, gap analysis is a technique that can be used for measuring performance achievement against a set target. It is particularly useful for measuring outputs of an activity over a period of time (Alshawi, 2007).

Optimal Performance Level

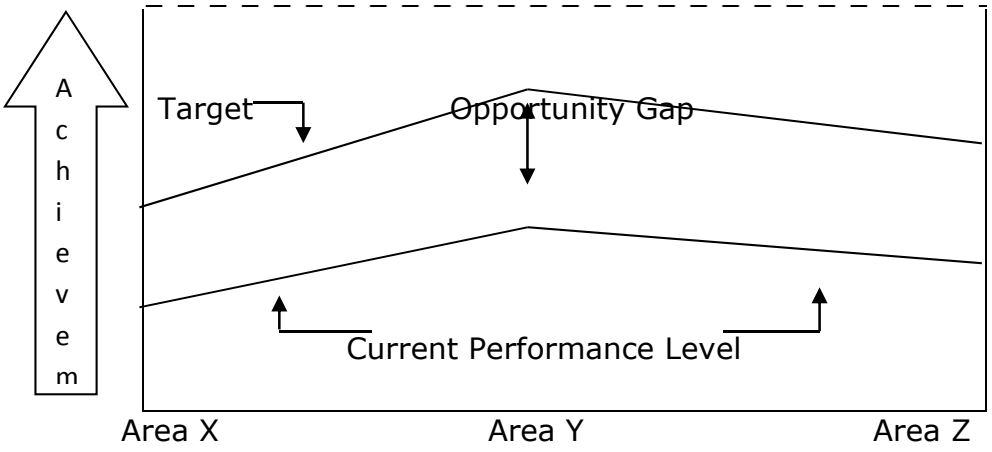

Figure 1.2: Performance Analysis Chart (Alshawi, 2007)

1.5. The Research Questions.

Two research questions are asked in this study, namely:

Q: What and how the IT Implementation Strategy Framework should be for Libyan Airports?

Q: How could IT be implemented effectively in Libyan Airports?

1.6 Research Aim and Objectives.

The aim of this research is to develop an Information Technology Strategy Framework for Libyan Airports. Its objectives are:

- To build up contextual knowledge of the research field including Information Technology and IT implementation strategies through a Literature review.
- To investigate two airports selected as case study airports in Libya to examine the level of successful implementation of Information Technology.
- To determine the requirements and needs of IT strategy in order to encourage the Libyan CAA (the owners of most of the civil airports in Libya) to expand their activities at these Libyan airports.

- To propose a hypothetical IT Implementation framework for Libyan airports based on the evaluation and assessment of data from objective 2.

- To draw conclusions and provide recommendation for its use.

1.7 Literature Review.

This section reviews some basic concepts and terminology connected to Information Technology (IT). It begins with definitions for Information Technology and then discusses probability, which underlines many of the analytical approaches to IT. It also looks at some of the background theories to Information Technology and on strategies for the implementation. Moreover, it explains the concept of IT exposure and IT acceptability. The section also discusses the IT strategy framework implementation process to gain an understanding of the essential steps required for successful IT strategy framework implementation. Finally, it presents an overview of the frameworks for systematic Information Technology strategies and implementation practices developed by the professional institutions.

The objective of this section is to review the literature on IT strategy implementation within aviation industry companies. This section also facilitates an understanding of the role of information technology in the improvement of smooth passengers' flow through an airport.

1.7.1 Information Technology Definitions.

A review of the literature on IT implementation has provided a wide variety of definitions, showing there is no single consensus of opinion and that the concept of IT is considered differently by different businesses and different people in different countries

1.7.2 Why Engage in Information Technology Implementation?

It seems that everything today is controlled by computers. From the supermarket to the doctor's office to the Internal Revenue Service (IRS), everyone keeps data on customers, patients, clients or business contacts. In fact, the evolution of the Internet has literally connected the world. Information technology specialists help to maintain and develop these computer systems.

1.7.3 Today's Information Technology.

While technology today encompasses a wide range of individual focuses, it is becoming increasing clear that the IT field of the future will include many more topics and will be more in demand than ever before. For those interested in becoming part of this rapidly growing field the time is now. Getting in on new developments could prove to be a very exciting and lucrative choice. (http://ezinearticles.com/?expert=Steve_Hill) Accessed on 17-08-10 at 21:10)

Today the outlook for jobs for people interested in this field is very good. With data security and server specialists among the highest paid in the field, those with the required skills and a keen interest in IT stand to earn a substantial annual income. There seems to be a steady stream of books published on the role of Information Technology within the businesses that it supports. The role of IT is constantly evolving and has changed significantly from the days when the IT organization was often referred to as the "data processing department." Today, in many industries, IT enables some businesses to differentiate themselves from their competitors. Those companies that leverage IT for competitive advantage often differ from their competitors in two ways with respect to their IT organization: they view IT as a strategic business enabler instead of as a cost centre, and they work to maximize the efficiency of their IT operations so that they can focus their resources on providing value to the business and respond to today's environment of rapidly changing business conditions. In summary, in today's economy IT organizations should undertake the following:

-Optimization: Business operations need to be evaluated to see where best practices can be implemented in order to improve efficiency and free up resources to work on more strategic activities. IT should be aligned with the business units within organizations. It is important that businesses view IT as a strategic enabler to distinguish themselves from competitors. Business executives should review the challenges and opportunities they face to identify how IT can be leveraged to address these challenges and opportunities.

-Investment in IT. Companies which invest in IT are companies that will survive any downturns and then excel as the economy improves. By optimizing

their infrastructure they will have the opportunity to invest by shifting resources from sustaining to strategic activities.

http://blogs.technet.com/b/itbizval/ (Accessed on 20-07-10 at 10:45)

1.8 Research Methodology.

According to Collis and Hussey (2009), methodology refers to the overall approach to the research process from the theoretical underpinning to the collection and analysis of data. There are several types of research methodology, which can help a researcher to conduct research. The nature of the research usually identifies the most appropriate methodology. The methodology employed must allow for the effective pursuit of the research objective(s) and answer the research question(s). This study will adopt the nested research methodology (Kagioglu et al., 2000). The nested model presents the research philosophy which guides and energises the inner research approaches and research techniques.

1.8.1 Research Philosophy.

Saunders et al. (2012) stated that the research philosophy is dependent on a researcher's thinking and assumptions about the progress of knowledge.

A failure to think through philosophical issues, while not necessarily fatal, can seriously affect the quality of management research (Easterby-Smith et al., 2008).

1.8.2 Research Strategy.

There are several different research approaches, each having advantages and disadvantages and none is more appropriate than others for all research purposes (Benbasat et al., 1987). Depending upon the researcher's aims, it is necessary to determine the best strategy to answer the research questions and allow for the objectives to be met.

1.8.3 Research Approach.

There are two very different research approaches, namely deductive and inductive research. In general, deductive research tends to proceed from theory to data (theory; method; data; findings) while inductive research tends to proceed from data to theory (method; data; findings; theory). As Gill and Johnson (2002) described, learning is undertaken by reflecting upon particular past experience and through the formulation of abstract concepts and theory.

1.8.3.1 Selection of Multi-Case Study Approach.

Yin (2011) observed that case studies can be exploratory, explanatory, and descriptive and can, therefore, be useful in pursuing different types of research questions. In this study the investigator will explore and recommend strategies to improve an IT strategy framework for Libyan Airports The problem has not yet been defined and there are few existing theories and little knowledge of the problem area.

The case study approach can be based on a single case or on multiple cases and the decision in this respect must be taken before data collection commences (Yin, 2013).

This study utilized the multiple case approach using the four cases listed below.

- ***Tripoli Airport – Libyan Case Study 1.***
- ***Benghazi Airport –Libyan Case Study 2.***

1.8.4 Research Techniques for Data Collection.

Yin (1994) asserted that, within a case study approach, there are six sources of evidence that can be utilized by the researcher, these being: interviews, archival records, documentation, direct observation, participant observation, and physical artifacts. Data may be collected from primary or secondary sources. Primary data refers to the collection of data through interviews, direct observation, participant-observation, focus groups, and questionnaires (Collis and Hussey, 2009; Saunders et al., 2012).

Various sources can be highly complementary and a good case study will use as many sources as possible, since through these it is possible to collect both primary and secondary data; literature review, the questionnaire and the interviews.

1.8.5 Data Analysis.

Data analysis comprises examining, categorising, tabulating and interpreting the evidence to support, reject or amend a theory and/or to generate

new theory. However, there is no standardised approach to the analysis of qualitative data (Saunders et al., 2012).

In order to deconstruct the data, explore the underlying meanings and to generate theory, (Miles and Huberman 1994) proposed the following stages for qualitative data analysis:

- Data reduction: Data reduction is the process of selecting, focusing, simplifying, abstracting and transforming the data obtained in order to focus on emergent constructs;
- Data display: Data display is the organisation of the compressed data, thus assembling the information from which conclusions may be drawn. The organisation and compression of the data is considered a means of making visible the themes that run through the data;
- Conclusion drawing and verification: These involve the researcher's interpretation of the data, extracting meaning out of the data displayed, identifying patterns and themes and using strategy to develop theory.

1.9 Scope and Limitations.

1.9.1 The Scope.

The research project focuses specifically on technology implementation to improve Information Technology capability in the aviation sector particularly within airports.

1.9.2 The Research Limitations.

This study has its limitations and these are listed below.

- This study only considers Information Technology implementation strategy.
- This study only explores IT implementation strategies in airports in Libya & the UK.
- This study only looks at an IT implementation strategy the implementation of other types will only be discussed in brief.
- This study looks only at Libyan and UK Airports. Other airports in other countries are not included.

1.10 Ethical Issues

According to University of Salford policy, the researcher applied for ethical approval to the University Ethics Committee and this was granted (REP Reference: REP10/098) prior to conducting interviews and the questionnaire surveys. The target respondents were informed about the aim and objectives of the study and were provided with detailed background information. Informed consent from all the questionnaire respondents and interview participants was obtained by the researcher as required by the ethical approval process.

1.10.1 Ethical Considerations.

Social research such as business research requires taking into account questions that go beyond ethics (Eriksson and Kovalainen, 2008). Ethics' consideration in research, according to Saunders et al. (2012, p. 129):

> *"…refers to the appropriateness of your behaviour in relation to the rights of those who become the subject of your work, or are affected by it."*

The participants in any research from whom information is collected or those who are studied by the researcher become participants of the study (Kumar, 2005). In this study the participants are airport employees. Eriksson and Kovalainen (2008) stated that, in order to establish a good scientific standard for issues under study, most scientific organizations have developed instructions; for example, informed consent to the research processes. According to the University of Salford policy, all students - whether undergraduate or postgraduate - who undertake research concerning human subjects, using human material or data must obtain ethical approval from the Research Governance and Ethics Committee (RGEC) to conduct their research. In this respect the researcher submitted a document that described the interviews and the questionnaire survey procedures as well as the informed consent form that each person who took part in the questionnaire survey or who was interviewed was given and was required to sign at beginning of the survey or at the onset of the interview or on the latter comes with questionnaire survey. The objective of this form was to ensure that each person given a questionnaire survey or who was interviewed was "given the opportunity to give free and informed consent about participation" (SSHRC, 2005, p. A.4). The Research Governance and Ethics Committee (RGEC) granted the researcher the ethical approval to conduct this field study.

1.11 Guide for thesis.

This dissertation will be divided into chapters as follows:

Chapter 1 provides an introduction to the study with an overview on IT implementation strategies for airports, justification for the research, the research questions, aim and objectives, the research methodology, the scope and limitation of the research as well as a guide to the thesis.

Chapter 2 reviews and explores the literature on background to Information Technology relating to IT Implementation strategies.

Chapter 3 looks at Libya background & it's Aviation and Airports generally and presents an overview and analysis of the Libyan economies and aviation industry.

Chapter 4 presents in detail the research methodology employed in the research including the research philosophy, approach, strategy, methods and techniques. These are elaborated and justified in this chapter.

Chapter 5 discusses the data collection. It explains the iterative testing process conducted through the field study in Libyan airports particularly in Tripoli and Benghazi.

Chapter 6 covers the analyses consisting of Quantitative Analyses using SPSS Tool for the Questionnaire Survey and Qualitative Analyses with Concept Mapping using Matrices for Data Obtained from the Interviews.

Chapter 7 presents the framework after the testing process and. refinement of the framework, It also covers the validation of the framework.

Chapter 8 draws conclusions and presents recommendations.

1.12 Chapter Summary

The foregoing sections have introduced a focus for the study and attempted to put the research into its context. The chapter has stressed that determining the acceptance of a system is very difficult but it is an important factor in research and application. Although there is currently no complete theory or model that declares the adoption of advanced IT implementation, there is an emerging understanding of the key variables in technology, people and processes that affect its acceptance. Implementation is more acceptable if the technology meets the basic requirements of usability and is perceived as being helpful for the user community. Users' experiences and training impact acceptance and the implementation of technology and the way that it contributes to organizational goals. Additionally, the aim and objectives of the research have been outlined covering the content and composition of the thesis. It has been indicated that both qualitative and quantitative data were collected as part of the empirical study and analyzed. The study therefore adopted a mixed methods approach. The next chapter progresses into the next stage which covers the review of literature.

Chapter 2

Literature Review

2.0 Literature Review

This section reviews some basic concepts and terminology connected to Information Technology (IT). It begins with Information Technology definitions and then discusses probability, which underlines many of the analytical approaches to IT. Additionally, it looks at some of the background theory of Information Technology and strategy framework implementation. Moreover, it

explains the concept of IT exposure and IT acceptability. The section also discusses the IT strategy framework implementation process to gain an understanding of the essential steps required for successful IT strategy framework implementation. Finally, it presents an overview of frameworks for systematic Information Technology strategy and for implementation practice developed by professional institutions.

The objective of this section is to review the literature on IT strategy implementation within aviation industry companies. This section facilitates an understanding of the role of information technology in the airports and to the improvement of the flow of passengers through the airport.

A review of the literature on IT implementation provides a wide variety of definitions, showing that there is no single consensus of opinion and that the concept of IT is considered differently by different businesses and by different people in different countries.

2.1 Definitions of Information Technology

IT (information technology) is a term that encompasses all forms of technology used to create, store, exchange and use information in its various forms (business data, voice conversations, still images, motion pictures, multimedia presentations, and other forms, including those not yet conceived). It is a convenient term that can include both telephony and computer technology in the same word. It is the technology that is driving what has often been called "the information revolution" (Davenport, 2013; Dillon, 2001).

An information system is also defined to be a set of information resources used to collect, store, process, maintain, use, share, disseminate, dispose, display, or transmit information (Committee on National Security Systems 2006). And similarly Wognum et al (2004) note that information systems purpose is to support companies in their information needs.

2.1.1 Defining and Studying Acceptance.

User acceptance can be defined as the demonstrable willingness within a user group to employ information technology for the tasks it is designed to support. Thus, acceptance theorists are less concerned with unintended uses or non-discretionary use of technologies and are more interested in understanding

the factors influencing the adoption of technologies as planned by the users who have some degree of choice. By developing and testing models on the forces which shape user acceptance, human factors' researchers seek to influence the process of design and implementation in a manner that will minimize the risk of resistance or rejection by users.

The scientific concern with user acceptance is comparatively recent since, traditionally, developers and procurers of new technology could rely on authorities to ensure that technology was used, at least in many industrial/organizational contexts. However, current working practices, as well as the large market for leisure and educational applications of information technology, have enabled greater choice amongst users thus increasing the need to determine the dynamics of acceptance.

The literature on acceptance is broad, ranging from case studies on accepted technologies to the individual psychological characteristics of acceptors or resistors (Dillon, 2001; Dillon and Morris, 1996).

Each facet of this area of literature can provide us with some understanding as to what makes users accept or reject a system but, since the issue is complex, it is unlikely that a single-variable explanation can be derived on the level of acceptance any information technology will receive among its intended users.

2.1.2 Characteristics of Acceptable technology.

According to Rogers' (1995) innovation diffusion theory, five characteristics of a technology determine its acceptance:

- Relative advantage (the extent to which it offers improvements over available tools);
- Compatibility (its consistency with social practices and norms among its users);
- Complexity (its ease of use or learning);
- Trial ability (the opportunity to try an innovation before committing to using it);
- Observability (the extent to which the technology's gains are clear to see).

Numerous diffusion studies have demonstrated that innovations affording relative advantages, having compatibility with existing practices and beliefs,

having low complexity, potential trialability and observability, will be more extensively and rapidly accepted than an innovation with the opposite characteristics. In particular, three of these characteristics seem to have the greatest influence: relative advantage, compatibility and lack of complexity. While the diffusion model has broad appeal, there are concerns that the characteristics Rogers lists are too loosely defined to provide a sound basis for a complete theory.

Shackel (1991) is one of the **few Human-Computer Interaction** (HCI) researchers to make explicit the link between usability and acceptability. According to his formulation, an acceptable system is one that appropriately satisfies the requirements of its users for utility, usability and cost. These attributes can be easily linked with Rogers' five characteristics showing a close overlap between the two distinct perspectives. However, while ability to use any technology is obviously necessary, it is not sufficient to ensure acceptability and many technologies that are demonstrably usable are never accepted by their target users.

2.1.3 Characteristics of Accepting Users.

Many researchers have attempted to identify psychological variables that distinguish users who accept or reject technologies. In a meta-analysis of research, Alavi and Joachimsthaler (1992) suggested that the most relevant user factors determining technology acceptance are cognitive style, personality, demographics, and user-situational variables. Cognitive style refers to the characteristic ways in which individuals process and use information and can be seen in information processing terms as a stable pattern of handling incoming stimuli and formulating responses Sears and Jacko, (2007). More than one hundred different dimensions can be found in the literature, although a core cluster accounts for the majority of the work on this topic. To date, however, few cognitive style dimensions have been shown to predict user behaviour with technology reliably.

Among the demographic variables that have been studied, age and education have been shown to influence system use in some contexts. As expected, higher educational attainment and lower age both seem to influence use positively, but the relationship is weak. Coupling demographic variables with contextual knowledge improves matters substantially and variables such as training, experience and user involvement correlate well with the acceptance of

new technology. Alavi and Joachimsthaler (1992) found that a broad group of user-situational factors were more important than individual difference variables. The innovation diffusion theory also suggests that factors at the level of the individual user are important. Rogers (1995) divided technology or innovation adopters into five categories depending on their speed of uptake: Innovators, Early Adopters, Early Majority, Late Majority and Laggards. Rogers plotted these categories over a normal distribution where the division between the early and the late majority is viewed as the mean, and thus laggards and late adopters constitute 50% of the population. Rogers estimated that early adopters and innovators (approximately 16% of the population according to his theory) are more likely to manifest risk-taking, be adventure seeking personalities as well as being wealthier and more educated than the norm. Thus, there is some agreement on the individual and situational factors that influence the acceptance of new technologies but the weight of evidence suggests context might be more important than personality or individual psychological factors alone.

Of the models available, the most widely cited is Davis et al.'s (1989) Technology Acceptance Model (TAM). TAM predicts that user acceptance of any technology is determined by two factors: perceived usefulness and perceived ease of use. Perceived usefulness is defined as the degree to which a user believes that using the system will enhance his or her performance (Chuttur, 2009; Davis 1989, p. 320). Perceived ease of use is defined as the degree to which the user believes that using the system will be free from effort. According to the TAM, both perceived usefulness and perceived ease of use have a significant impact on a user's attitude toward using a system.

Davis' research shows that the TAM can explain approximately 50% of the variance in acceptance levels for many routine office applications, and the results from several studies of the TAM indicate that usefulness is the most important predictor of use, explaining significantly more variance than ease of use ratings by users. Impressively, the TAM has been widely applied across different application types with consistent results' performance (Chuttur, 2009; Davis 1989, p. 320). Furthermore, it is easy to administer since it involves little more than asking users to provide ratings of agreement/disagreement to a series of short statements such as: Learning to use this application would be easy for me. However, research on the TAM is typically based on a single time period when

users are exposed to a ready-made system (Legrisa et al., 2003). This makes it useful for choosing between competing technologies at the implementation stage but less applicable in the early stages of design where designers are trying to determine how best to design a technology so that it will prove acceptable.

2.2 The characteristics and implementation of IT

Organizations are investing a lot in information technology and information systems. As markets are getting more and more competitive companies simply have to be swift in adopting new technology to keep up the phase of the changing environment (Kadiyala 2005). And indeed, information systems can do a lot for the organization in effecting the processes and the handling of information. Li (1999 cited in Al-Mashari et al 2003) argues that ERP systems have made business more efficient since they provide everybody with seamless access to information they need. Similarly Smith (2004) discusses that Product Data Management (PDM) systems can facilitate information sharing. Information technology in general has made new organizational forms and new ways of working and collaborating possible (Mukherji 2002).

Dewett and Jones (2001) have closely investigated how IT impacts an organization and its characteristics. In the model they present, IT functions as moderator between the organizational characteristics (e.g. size and culture) and organizational outcomes. They argue that this moderating effect of IT is due to the fact that IT generates *information efficiencies* and *information synergies*. Information efficiencies are the possible cost and time savings that can be achieved if IT enables employees to work more efficiently.

Information synergies are the performance gains that can be achieved if IT enhances collaboration and cooperation possibilities. These two concepts are benefits in themselves (the authors call them "meta-benefits") but they also lead to 5 more concrete organizational outcomes; (1) IT links and enables employees, (2) IT codifies the knowledge base, (3) IT increases boundary spanning, (4) IT promotes efficiency, and (5) IT promotes innovation (Dewett and Jones 2001).

Dewett and Jones include in each of these five outcomes. These outcomes make up a basis for possible IS project benefits.

The first is claimed to be the most fundamental. IT links and enables people to communicate and collaborate over the borders of divisions and functions in an organization. Two things are worth noting though; first, merely a technical link is

not enough - the communication needs to be supported with organizational methods as well and secondly, increased communication also means increased amounts of unnecessary and unusable information sharing. But overall, increased communication and possibility to communicate is the most important effect IT can have on the organization. (Dewett andJones 2001)

The second outcome; that IT codifies the knowledge base means that IT is a facilitator in knowledge sharing and capturing. Hence, IT is a tool in a company's knowledge management. The third outcome; that IT increases boundary spanning is related to the first outcome but focus is on the tools that IT creates for searching new information from e.g. other organizational units. This means that e.g. information needed to solve some problem can be taken from another division that has had the same kind of problem. The fourth outcome means that IT promotes efficiency in the way that IT enables more efficient ways of working in e.g. decision making, communication, information storing, and information retrieving. (Dewett and Jones 2000)

The last outcome; that IT promotes innovation is the result of all the above mentioned outcomes. IT promotes innovation through enabling virtual organizations and other new organization forms, through making information seeking easier, and through enhancing monitoring of project progress. Dewett and Jones further argue that this effect of IT should get more attention in the discussion on how IT's effect on an organization is measured; they claim that focus is now very much on efficiency-enhancing properties while IT's ability to develop the organization through e.g. promoting innovation should be more noted. (Dewett and Jones 2000)

2.3 Information Technology induce change in an organisation

McLoughlin and Clark (cited in Salminen 2000) report that extensive research shows that technology in general imposes change on many levels in an organization. Salminen (2000) also reports that Sharratt and McMurdo note that information systems implementation brings about new ways of doing business. Information systems projects should be treated as change projects. Cameron and Green (2004) support the same view and dedicate a whole chapter in their book on organizational change management to IT-based process change. Wognum et al (2004) summarize this issue in quite a descriptive way; 'implementation of technology with an impact on several functions and levels of an organization not

only induces organizational change, but also requires organizational change'. This point of view, that information system implementation projects are change projects by nature, is kept throughout this thesis. And already now we can note that change projects are in all their forms challenging endeavors for organizations (Buhanist 2000; Salminen 2000; Cook et al. 2004, p.1). And as Sammon (2001 cited in Loonam & McDonagh 2007) has concluded the biggest implementation risks in IS projects are in the change management field. So if the organizational change factors in IS projects are overlooked the project is almost bound to be challenging.

2.3.1 The strategic importance of information systems

Literature is clear about the fact that the IT strategy and information systems pl ans of anorganization need to be in line with the business strategy (Shupe & Behling 2006; Reich & Benbasat 1996; Teo & King 1996). But the actual strategic value of IT itself is still subject for debate (Oh & Pinsonneault 2007). To begin with, Hallikainen (2003, p.45) notes that nowadays information system projects are often means in larger strategic development and change projects which would indicate that their strategic importance is rather notable.

Similarly, Lee et al (2006) claim that a global business must not only have a global business strategy but the strategy must be backed up by information systems in line with the strategy. But there are different opinions about the shape of the strategic impact.

First of all, not all information systems have a strategic role. The management has to be able to evaluate how and in what extent an information system contributes to the organization's strategy in order to decide upon the amount of attention that the IS project needs. This is yet another reason for business and information management to work together. (Cameron & Green 2004, p.246)

Secondly, there are different aspects to the strategic value of IT.

Oh and Pinsonneault (2007) discuss this issue. They investigate two approaches to assessing strategic value of IT; the resource-centered perspective and the contingency-based. The first approach says that IT is a strategic resource in itself and that IT can – in combination with other strategic resources – influence business. The other approach says that the strategic value of IT is only realized if it is planned to support the main strategy; i.e. IT in itself has no strategic value,

but when managed to support the general strategy its strategic role is realized. The findings that Oh and Pinsonneault report indicate that both approaches should be used as they are actually complementary rather than competing approaches, though the authors do slightly lean towards the contingency-base approach. Furthermore, they report one concrete finding which is that using IT to reduce costs rather than to increase revenue seems to be more beneficial for the organization. This can be seen to have implications on how to address the issue of information systems implementation; information systems should be strategic instruments mainly used to create savings for the company. (Oh & Pinsonneault 2007).

Saeed and Abdinnour-Helm (2008) have found that the way how system integration is done – and perceived – has a direct influence on IS usefulness. Also information quality affects the usage of the IS. These are results worth noting in the technical part of system implementation. Partly on the same topic we can note that Loonam and McDonagh (2007) state that management should not let the vendor dictate the technical solution but take an active part in those decisions as well.

Al-Mashari et al (2003) also give system testing a critical position in the implementation and say that the functionalities need to be tested both alone and together with other (existing) technology. The testing should also confirm that the system is working according to business requirements. (Al-Mashari et al 2003.)
Other technological issues that are critical for implementation success are such as keeping in mind that the system is adjustable enough in possible future merger-situations (Loonam and McDonagh 2007) and assuring system reliability (Soja 2006). It is also pointed out that key technology issues should be handled early enough in the implementation project (Mabert et al 2003).

2.3.2 Designing and Implementing Acceptable Technologies.

Theorists from the socio-technical systems tradition such as Eason (1988) have argued that information technologies are embedded in working practices and that these practices manifest a network of social relationships such as cooperation among users, management relationships and so forth. Accordingly, any technology cannot be fully analysed or understood, in terms of usability where this is conceptualized, in isolation of an organization's goals or the work context it is intended to support. In order to jointly optimize both the social and technical

attributes of any organization, allowance must be taken at the design level of the social dynamics of any organization or any group within it

Socio-technical systems' theory has given birth to a framework for technology design that emphasizes the analysis of all stakeholders (not just the direct users of a technology), the formation of planning groups to oversee the design, the performance of prototyping exercises, and the analysis of the likely impact the technology will have on the organization. The intention of such a design process is to avoid unpleasant side effects in working practices (which would lead to resistance) and to ensure as much a social solution as a technical solution to the computing needs of an organization is obtained.

Eason (1988) viewed acceptance in terms of two competing forces: control and enhancement. Control factors are those that impose rules or structures upon the users, thereby removing autonomy (control over their own actions) from them. According to socio-technical thinkers, working group autonomy is to be encouraged since it is considered to increase satisfaction and long-term performance (Karwowski, 2006). Among the control issues raised with respect to technology design are: access, reliability, confidentiality, monitoring, pacing, stress, social contact. The low or high presence of certain factors (e.g., low reliability, high pacing) with the introduction of a new technology is likely to reduce the users' perception of control and thus increase the risk of resistance.

To date there has been little controlled study on the importance of such control and enhancement variables. Socio-technical researchers tend toward case studies on designs and their implementation rather than controlled experiments rendering specific and individual weighting of control and enhancement factors problematic. However, this perspective offers insights that might prove amenable to further research which moves us beyond the search for single technological or user variables.

2.4 Why Engage in Information Technology Implementation?

It seems that everything today is controlled by computers. From the supermarket to the doctor's office to the *Internal Revenue Service* (IRS), everyone keeps data on customers, patients, clients or business contacts. In fact, the evolution of the Internet has literally connected the world. Information technology specialists help to maintain and develop these computer systems.

2.4.1 The Benefits of Systematic IT

- **Background:** Experts consider industry information technology key to improving the efficiency and quality of any kind of industry.
- **Purpose:** To systematically review evidence of the effect of aviation industry information technology on quality, efficiency, costs of business and smooth flow.
- **Study Selection:** Descriptive and comparative studies and systematic reviews of organisation information technology.

2.4.2 IT Implementation Strategy Process.

There is a necessary connection between strategy and the resources available to achieve a firm's business goals. For example, in Chandler's (1962) "Find the reference definition", strategy is 'the determination of the basic long-term goals and objectives of an enterprise and the adoption of courses of action and the allocation of resources necessary for carrying out the goals'. A much broader definition, specific to business enterprises, is provided below although here resource allocation is only implied.

Corporate strategy is the pattern of decisions in a company that determines and reveals its objectives, purposes, goals; produces the principal policies and plans for achieving these goals, and defines the range of business the company is to pursue, the kind of economic and human organization it is or intends to be, and the nature of the economic and non-economic contributions it intends to make to its shareholders, employees, customers, and communities (Andrews, 1980). In Andrews' definition, there appears to be a clear division between strategy formulation and its implementation. It is at the implementation stage that resource allocation becomes crucial. This is in keeping with the classical or planned model of thinking about strategy. It is too simplistic to separate strategy implementation from strategy formulation (Stacey, 2007), since a strategy has to be adaptive and evolving, while keeping at the forefront the ends and goals that need to be met for the business to remain viable. (Barney, 1991).

Information Technology as a resource these days transforms strategy formulation into a continuous process with performance feedback available to decision makers on a daily, if not an hourly, basis (Davenport, 2013). It is

therefore spurious to isolate strategy formulation as a one-off activity, although strategy by its very nature has to result in a long-term orientation. Porter (1991) made an important distinction between operational effectiveness and strategy. He contended that the operational effectiveness of businesses is necessary for their success but is not sufficient in itself without a well thought- out strategy behind it. In the recent past, companies in their search for market advantage through higher productivity have resorted to a number of management tools. These include, Total Quality Management, benchmarking, time-based competition, outsourcing, partnering, reengineering and change management. These tools are useful and may enable firms to perform similar activities better than their competitors. But to be effective, strategic thinking requires the performance of different activities to your rivals, performing the same activities differently (Kapferer, 2012).

2.4.3 Success Factors in the Airport Industry.

The airport business can be seen both as being a service industry and as being part of (national) infrastructure. On the one hand, demand for service may change at short notice including a demand for change in infrastructural characteristics. This usually involves changing streams of revenue from the customers (e.g. airlines, passengers). On the other hand, the infrastructural characteristics of this industry incur capital cost for long periods that are paid for by the owners of an airport (often up to thirty years, e.g. for runways). So, a major challenge within airport management would be to address the different business cycles found in this industry (i.e. amongst the different business partners) with proper investments.

In a more general way, Porter's widely known concept of 'competitive forces' (Porter, 1980 and 1998) places any company into its competitive environment, determined by the power of buyers, the power of suppliers, the substitutes available for products and services, possible new entrants and existing competitors (Albers, 2008). The same applies to airports (e.g. high speed rail as a substitute for certain air services).

Based on Porter's works, Park (2003) applied the above to the airport industry. He identified factors that can play a role in an airport's competitive advantage (see figure 2-1). In the context of the research topic, a core question focuses on the potential contribution of information technology (IT) within these

groups of factors. Many of the factors are predetermined e.g.by the location of an airport.

Figure 2-1: Factors of airport competitiveness. (Source: Park, 2003, p. 354).

Usually, there are certain categories, into which IT support may be divided:

- Control of processes or machines (e.g. baggage sortation)
- Information distribution (e.g. display of flight information to public)
- Administrative support (e.g. invoicing, automated purchase orders, decision support, planning and marketing).

In addition, there are different technical elements within IT that contribute towards a successful IT function such as:

- Hardware infrastructure (e.g. physical networks, storage units, processing units).
- Software infrastructure (e.g. operating systems, message bus, mail systems).
- Commodity software applications (office support such as spreadsheets, word processing, electronic calendar)
- Specialized software applications (e.g. flight information display systems, baggage tracking systems, an airport operational database).

Besides these rather tangible elements there is also the intangible element of managing the IT function (usually referred to as IT management or IT governance). It is assumed that if all the different aspects are carefully aligned, IT may contribute towards the success of an airport. Furthermore, the different players in the airport context may contribute to a variety of the above aspects.

Not looking at extending existing models, but asking for the reasons for possible alignment, Luftman et al. (1999) focussed on enablers and inhibitors in their study. Their study found several contributing factors regarding alignment, as shown in table 2-1.

Enablers	**Inhibitors**
Senior executive support for IT	IT/business lacks close relationship
IT involved in strategy development IT understands the business	IT does not prioritize well IT fails to meet its commitments
Business/IT partnership Well-prioritized IT projects IT demonstrates leadership	IT does not understand business Senior executives do not support IT IT management lacks leadership

Table 2-1: Enablers and inhibitors of alignment. (Adopted from Luftman et al. 1999).

Most of the alignment models assume that there is a certain budget that the IT function spends in order to support the business function in a desired way. In table 2-1 arguments like 'IT understands the business' or 'well-prioritized IT projects' suggest such an assumption. However, the IT budget needs to be split into different portions in order to deliver IT services in the long run. For example, it may become necessary to invest into an IT infrastructure in order to cope with future business requirements. As the researcher understand the organisation in Libya don't spend a lot of money in IT requirements than even more difficult for the organisation to spend on IT infrastructure.

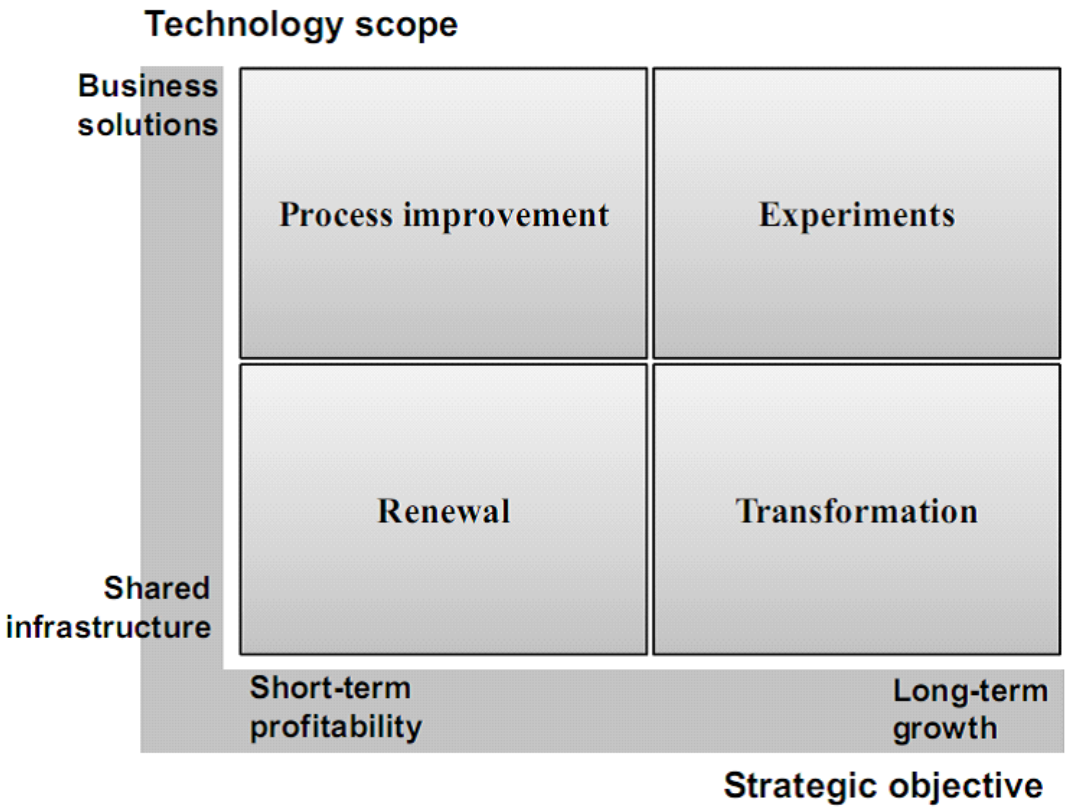

Figure 2-2: Technology scope

But in case strategy changes in a way that causes its innovative component to be stressed, a different type of IT investment would become necessary. Although it is not explicitly mentioned in the model above (figure 2-2), the investment function needs to be a core part of business/IT alignment, too. A framework that supports this idea is presented by Ross and Beath (2002).

The key value questions to be answered by this approach are as follows (Apfel and Smith, 2003):

- What is the initiative?
- How will the organisation measure the business value?
- What does the technology do?
- How much benefit will the organisation receive?
- How much will it cost?
- How does the organisation take into account future uncertainty?
- Is the enterprise positioned to exploit these capabilities?

For each of the questions there is a set of standard tools or best practices that can be applied to provide a sufficient answer. The aforementioned balanced

scorecard approach and its extension to strategy maps (Kaplan and Norton, 2000 and 2004) linked to performance measures would be such a possible best practice methodology. As mentioned before, a scorecard on its own would not reflect the IT portion of an investment.

This research project looks at the IT contribution within a production environment. Nevertheless, such an IT solution should have as few requirements as possible towards the other environments (to keep costs low for development and at run-time).

The amount and type of IT solutions found at an airport vary considerably, and are much dependent on the size and business model of the airport concerned. The range may be from half-a-dozen IT applications to several hundred IT applications.

As a first common attempt to list/categorise IT systems within the aviation industry the International Air Transport Association (IATA) and the Airports' Council International (ACI) introduced an implementation scenario for IT solutions in an airport (see figure 2.3).

The major IT solutions utilised by the different players at an airport are supposed to use an individual sub-set of information from centralized airport data monitoring (ADM in figure 2.3). At the same time, the the IT focus should be? on current information in respect to flight operations. A sort of 'midend' across all architectural layers is defined by the Airport Systems' Integration guidelines (ASI in figure 2.3). These basically aim to enable the exchange of information amongst the players (possibly in an automated manner).

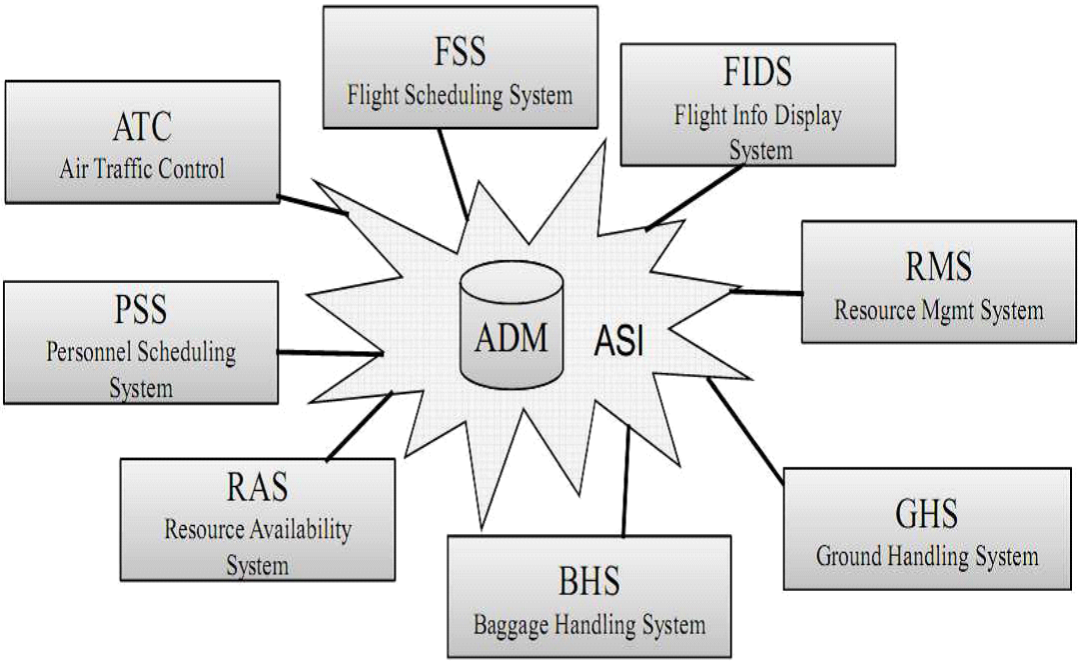

Figure 2-3: Generic IT systems' landscape at an airport according to an implementation scenario by IATA and ACI (April 1998). Illustration produced by the author.

The implementation scenario, as presented in figure 2-3. is independent from an airport's business model as far as the (technical) integration of the business processes (or functions) by means of information exchange is considered.

In respect to the alignment of the business function and the IT function for airports, it can be concluded that most of the alignment models (Sage, 2006) may be applied to the research context. However, a lack of causality in the relationship between IT as an input factor and as business performance (in the form of quantifiable output) limits the statements of many models (Gattorna, 2009). Porter's value chain and the concept of information intensity seem to be a vehicle that can identify the processes that influence (more than others) business performance in cases where it is supported by IT.

2.5 IT Response and Monitoring.

One of the most common complaints that one hears from users is that the 'network is slow'. But how can one relate a subjective viewpoint to an objective measurement that one can monitor and report on? And should there not be a

pretty good idea of what response times are likely to be for an application before it is rolled out to users, instead of after?

There are various management packages that offer application response monitoring, but this capability tends to be part of a comprehensive, complex and expensive systems' management portfolio. Before organisations decide whether they want - and have the budget for - a full-scale commercial offering, it is recommended that they have a look at what can be done with some home-grown monitoring processes.

2.5.1- Technology Monitoring (TM) as Part of the Business Process

TM can be implemented as a formalised process or it can be considered as an implicit part of an organisation's research and development (R&D) activities. As it provides critical input for strategic decision making with regard to potential technology opportunities and threats, there should be a clear and visible ownership (Davenport, 2013; Okumus, 2004). Major benefits derived from TM are:

· Knowing the competitive position.

· Knowing the future trends.

· Detecting opportunities and threats.

· Re-orienting R&D.

· Concentrating R&D on truly new objectives ("don't reinvent the wheel").

2.5.2- Technology Monitoring within the Wider Framework

· Technology Monitoring (TM) provides input to Technology Road Mapping (TRM).

· Technology Intelligence (TI), Technology Assessment (TA) and Technology Forecasting (TF) are part of TM.

· Technology Monitoring and Technology Road Mapping provide input to Strategic Planning (SP).

· Benchmarking, in the sense of Technology Auditing, is part of TM.

· Knowledge Management (KM) is the overarching system that can improve the availability of knowledge where it is needed and hence its exploitability. KM provides the framework for TM.

2.6 Definition of Corporate Information Technology

In the broadest sense, information technology refers to both the hardware and software that are used to store, retrieve, and manipulate information (Stair, & Reynolds, 2013; Oz, 2008). At the lowest level, there are the servers providing the operating system. Installed on these servers are items such as databases and web serving software. The servers are connected to each other and to users via a network infrastructure. The users accessing these servers have their own hardware, operating systems and software tools. http://www.mariosalexandrou.com/ O20-08-2010 at 18:30

Information technology has been defined by the Information Technology Association of America or the ITAA, as being the study, design, development, implementation support and/or management of any computer based information system. It relates particularly to software applications and to computer hardware. Information Technology deals with using electronic computers and software to convert, store, protect, process and retrieve with security, or transmit, any information. What began many years ago as a term that many had no awareness of, is now a term that has skyrocketed to include several aspects of computing and technology.

Everything including data management, networking, engineering, computer hardware, software design, database design and management and administration of systems is included in the term of Information Technology. When covering the aspects of IT as a whole, computers and information are deeply intertwined.

2.7 Today's Information Technology

While technology today encompasses a wide range of individual focuses, it is becoming increasingly clear that the IT field of the future will include many more topics and more demand than ever before. For those interested in becoming part of this rapidly growing field the time to get involved is now. Getting in on new developments could prove to be a very exciting and lucrative choice. http://ezinearticles.com/ On 17-08-2010 at 21:10

The history of IT goes back years and years. In order to perform the functions associated with the field of technology present day usage utilises computers, servers, database management systems and cryptography. It was not very long ago that the field of IT consisted only of a single computer operator who

stored data on a magnetic tape and then placed it in storage. Times have changed drastically in the field of technology from its inception several years ago. The field today typically includes a Chief Information Officer and several individuals who work together to achieve their goals. Years ago there was simply a single operator who performed all the tasks relating to this form of technology.

Today the job outlook for people interested in this field is very good. With data security and server specialists among the highest paid in the field, those with the required skills and a keen interest in IT stand to earn a substantial annual income.

There seems to be a steady stream of books published on the role of Information Technology within the businesses it supports. The role of IT is constantly evolving and has changed significantly from the days when an IT organization was often referred to as a "data processing" organization Today, in many industries, IT enables some businesses to differentiate themselves from their competitors. Those companies that leverage IT for competitive advantage often differ from their competitors in two ways with respect to their IT organization: they view IT as a strategic business enabler instead of as a cost centre, and they work to maximize the efficiency of their IT operations so that they can focus their resources on providing value for the business and can respond to today's environment of rapidly changing business conditions. In summary, in today's economy IT organizations should undertake the following:

2.7.1 The Role of IT.

The role of Information Technology (IT) in modern organizations is becoming progressively critical. Organizations with effective IT management have achieved a wide range of benefits such as accurate reporting, effective monitoring and analysis of activities throughout business processes, a comprehensive view of customers, products and supplies and reduced errors and expenses.

As a matter of fact, Information Technology is a business function which uses process and technology regulations to define, manage and share master data across the organization (Benjamin & Blunt, 2012). In addition, it facilitates the major tasks of planning, executing and controlling within an organization. A well-structured IT department sets objectives and selects the best course of action to meet these objectives through the coordination of human and intangible

resources. In addition, it ensures that objectives are met by monitoring and measuring progress regularly so as to identify variances from an original plan and take corrective action, where necessary (Van der Waldt, 2011; Olawale & Sun, 2012). Information Technology is a part of corporate strategy. For instance, when the top management of a firm decides on the installation of a CRM (Customer Relationship Management) system, it has already decided on a set of values, goals, tactics and strategy. In order for this CRM system to function properly and meet the firm's strategic goals, employees need to be trained and motivated so as to meet organizational goals. Therefore, the technological investments that the firm undertakes are handled as part of the firm's strategic portfolio.

To conclude, the future of IT seems bright. New modes of business thinking and operation are being applied to improve organizational efficiency and success. Concepts like self-organizing systems, knowledge management and empowerment initiatives are particularly related to IT functions. Moreover, using Information Technology to link data between information systems achieves a higher level of information quality and the ability to analyse activities across business functions. Therefore, Information Technology needs to receive the same degree of analysis and study by management as any other business function within the organization. In fact, information technology must be a "real" part of the organization. http://www.helium.com/ on 23-06-2010 at 10:00

2.7.2 Information Technology Implementation Capability in the Libyan Context.

Many researchers have asserted that the lack of IT knowledge in general, and skilled IT technicians in particular, as well as the low degree of industrialisation in the aviation industry in Libya are the main reasons for the inadequate industry capabilities that have caused long delays in the implementation of Libyan airports' programmes. Libya's IT workforce only have low capability to meet the demands of industry generally the airports' industry and the Libyan government is demanding that its projects be completed faster to fill in the shortages. Offsite manufacturing technology appears to be one approach to overcome the challenges. Off-site manufacturing has several advantages including lower time project duration, higher quality, lower cost, more productivity, fewer people on site and simpler work processes (Gibb and Isack,

2003). In addition, the Internet has improved communication systems. However, collaboration between people in local and foreign companies requires a common medium of communication and, in this respect, Salama and Flanagan (2005) have argued that a poor command of English among the Libyan labour force affects and reduces any benefits that might be gained from foreign companies.

2.8 Chapter Summary

Determining the acceptance of a system is the most difficult but the important human factors are research and application Although there is currently no complete theory or a model is an emerging understanding of the key variables in technology, people and processes that affect the acceptance implementation. Technology meets the basic requirements of usability and is perceived, as intended, as being helpful for the user community, user experience and the training impact on the acceptance as the way of implementing technology that contributes to organizational goals and ways of working.

By end this chapter the first and second objectives of the study have been achieved which in turn will help in enhancing and facilitating interpretation of the research findings.

The next chapter considers the Libyan context in which this research fieldwork takes place.

Chapter 3

Libyan Background: its Aviation and Airports

3.0 The Libyan background

3.1 Introduction

It has been the Libyan government's major aspiration to convert the country into a major hub for international commerce and tourism and to be an important country for attracting foreign investments generally and, in particular, to attract foreign investment to provide a boost to the aviation sector. It is believed that foreign and local capital can share the responsibility of developing the Libyan economy to a competitive level, both to satisfy local needs and to

increase exports. Libya seeks to have a favourable investments' climate which, together with government incentives, exemptions and facilities, may encourage global industries to consider establishing companies and industries within Libya to bolster the country's export section and provide a source for being a major foreign exchange earner.

It is imperative that a study of this nature on IT system requirements within the Libyan air industry that will allow for improvements in the sector must consider some important characteristics of the Libyan business environment. The economic environment in Libya involves a mixture of government directives and market forces. The aim of this chapter is to outline the important features of this environment, to highlight some of the economic developments that have taken place in Libya and to present the main government policies towards all companies and organisations in terms of business laws and regulations, particularly those relating to foreign investments in the tourism and aviation sectors, with an emphasis on those that are currently in force. The chapter also aims to identify vital policy issues relevant to the air travel industry.

This chapter will discuss certain aspects with regard to the Libyan business environment which include geographic and social demographics, the economic and political background, the infrastructure, financial services, the taxation system and government policies towards the Libyan aviation sector.

3.2 Geography, Politics and the Socio-Economic Background

3.2.1 Location and Area

Libya is geographically situated in North Africa. It is a significant Arab nation both in size and in wealth. It is bordered by the Mediterranean Sea to the north, by Egypt and Sudan to the east, Tunisia and Algeria to the west and Chad and Niger to the south. Libya is located between the 25 00' North latitude and 17 00' East longitudes (Mapsofworld, 2013).

Thus, the location of Libya is in the centre of the North African states. It is at a crossroads between Europe and the middle of Africa and this may give Libya a considerable advantage over many other countries as a potential location for investment and for manufacturing entities maintained by multinational companies.

The major cities are Tripoli (the capital city) which is in the north-west, Benghazi in the north-east and Sabbha in the south of the country.

Libya has a total area of 1,775,500 square kilometres making it the fourth largest country in Africa. Its size equals the size of Germany, France, Holland and the Scandinavian countries put together (Libyaconnected, 2013). Libya's terrain provides a range of landscapes and climates. The country has a long coastline of nearly 1,900km facing the Mediterranean Sea, comprising mostly virgin beaches with an outstanding environment which makes it a productive area for sea sports, diving and all kinds of beach activities. The Libyan Desert lies in the southern part of the country (making up nearly 80% of the country's area) and has significant tourist sites that may play a key role in making Libya one of the most important tourist destinations for desert tourism in the world (Brookes, 2001).

3.3 Historical and Political Background

Historically, Libya was the name of the territory, located in North Africa between Egypt and Tunisia, which was the homeland of the Libo tribe that inhabited this region for thousands of years. In 1934 Italy adopted the name "Libya" for the area of modern Libya which is a union of three historically distinct regions, namely north-eastern Cyrenaica or Barqa, north-western Tripolitania, and the more remote south-western region of Fezzan (Blanchard, 2012; Pappe, 2005). In the Second World War, Libya was an important battleground in the North Africa campaign and emerged from the fighting as a ward of the Allied powers and the United Nations (Ibid).

On 24th December 1951, the United Kingdom of Libya became one of Africa's first independent states with United Nations' supervision and assistance. A federal system of government was established with the central authority vested in King Idris Al-Sanussi (1951-1969). The first parliamentary election was held in February 1952, one month after independence (Ibid).

In September 1969 while King Idris Al-Sanussi was receiving medical treatment abroad, army officers, including Gaddafi, undertook a military coup against him. As a result of this coup, the ruling system of the monarchy was annulled and Libya was declared a Libyan Arab Republic and the Revolutionary Command Council (which consisted of officers who were involved with Gaddafi in the ousting of King Idris) became the supreme authority in the country (Jibril,

2011).

In 1977 Gaddafi held a monopoly of power by dissolving the Revolutionary Command Council. He announced the power of the people and resigned from the presidency. (The essence of this announcement was that the Libyan people governed themselves through the People's Congresses which were established by an order from Gaddafi. However, most Libyan people refused to attend these Congresses because of their frequent disputes and their lack of relevance to what the people wanted.) Gaddafi's resignation was merely a constructed issue and was not credible. Subsequently, he cancelled the 1951 state constitution and changed the name of Libya from the Libyan Arab Republic to the Socialist People's Libyan Arab Jamahiriya (Jibril, 2011). Also, upon this announcement on the power of people, the state's laws were meant to be changed in the light of the perceptions and ideologies of Gaddafi's Green Book (Ahmad, 2013).

According to the Green Book, and also according to later slogans, Gaddafi ensured that factory workers went to their factories and demanded to become partners and not employees, and thus all workers in Libyan factories owned 10% of the factories' shares.

The experience of that time, after the announcement of the power of the people by Gaddafi, was described by Jibril (2011) as a mixture of communist primitive ideas with chaotic touches. Also, Gaddafi's regime (1969 - 2011) was marked by hostility to the West. He instilled his ideas in Libyan people's minds through his slogans which were publicised in all Libyan villages and towns and through the imposition of the teaching of his ideas in the Green Book in all stages of education in Libya. There was a fear of strangers and an avoidance of intervention by Western powers in the country's affairs.

In the mid-1970s Gaddafi started to nationalize all the Libyan industries and enterprises in general and the oil industries and enterprises in particular to prevent, as he claimed, the intervention of Western powers in the country's affairs (Ahmed, 2013).

As a result of Gaddafi's policy of hostility against the West, the United Nations imposed economic sanctions and banned flights to and from Libya in April 1996; thus the Libyan people lived in isolation from the international community

until September 2003 at which time Gaddafi abandoned the production of conventional weapons (Falola et al., 2012).

Gaddafi allowed foreign companies under government control to invest in Libya after the country was removed from the United States' list of terrorist states in May 2006. This was allowed by these companies participating with, or merging with, a Libyan partner/organisation.

The Gaddafi regime (1969-2011) is acknowledged to have been erratic in the management of the institutions and organisations of the state, including the governmental administration and the legal system, due to the way in which the administrators of these units were appointed. They were selected based on their loyalty and obedience to the top of the pyramid of the state (i.e., to Muammar Gaddafi and his revolutionary forces) (Ahmad, 2013).

The criteria for selecting the administration of any organization in Libya were not based on scientific qualifications and on experience in the field of management and development even though these were the skills that the country desperately needed as a developing country (dependent almost entirely economically on the revenues from oil exports).

3.3.1 Political and Legal System.

The Libyan political system involved a system of councils where all had the right to express their opinions. The people exercised their authority through people's committees, people's congresses unions and professional associations, and the General People's Congress (up to 20 August 2011 when the revolution succeeded and the state of the country is nowadays unstable). The basic idea of the system was popular influence and responsibility, through a system of direct influence in a pyramidal system. Elections were direct and all voting consisted of a show of hands or a division into yea or nay camps. Suffrage was universal and committee/congress membership remained open to all Libyan citizens of eighteen years of age or older who were in good health and had legal and political standing. This system no longer exists, as there have been changes since the rebels took over.

The country was organised into 20,699 basic people's administrative congresses which oversaw 27 municipal administrative units. Representatives to

higher institutions were elected by the members of the General People's Congress which was made up of the chairmen of the Basic People's Congresses (BPC), the branch and municipal people's committees, and representatives of the people's committee for unions, professional associations and student unions (UAM, 2008). It is worth noting that Libya was considerably more politically stable as compared to many other countries in the Middle East and North Africa (MENA) (Porter, 2006).

The Libyan legal system was based on a combination of the Italian and French civil law systems and Islamic laws. This system included three levels: the court of first instance, the court of appeals, and the Supreme Court which is the final appellate level. The General People's Congress appointed justices to the Supreme Court. Other courts in Libya were military courts which operated outside the normal court system and dealt with military issues (SIS, 2006). The state of the country today is such that no one is sure of the legal system currently in operation.

On 15th February 2011, Libya experienced a full-scale revolt against Gaddafi's dictatorship and, in the city of Benghazi, the National Transitional Council (NTC) was established to administer the areas of Libya under rebel control. The NTC issued a Constitutional Declaration in August 2011 in which it set up a road-map for the transition of the country to a constitutional democracy. The NTC governed Libya until 8th August 2012 after which it handed power to the General National Congress (GNC) which was elected by Libyan people on 7th July 2012.

Currently the interim government's mission is to facilitate the state's business on a temporary basis. It does not have the right to amend or cancel any laws or regulations until after the preparation of the country's constitution and after the election of a permanent government that is expected to be elected in 2015 (NTC, 2013).

3.3.2 Climate

Libya enjoys four seasons of equal length in the year. The climate varies between summer and winter. In summer, it is fairly hot during the day and pleasant in the evening and during the nights. It is significant to note here that the highest temperature ever to be recorded in the entire world occurred in Libya. In winter, the weather is generally moderate, wet and cool. Considerable amounts of rain fall in the north in the spring and the autumn (Mgell, 1995).

3.3.3 Population and Language

The population in Libya in 2007 was 5,870,404 with the vast majority (80%) living along the coastline (where most economic activities take place) while others live in the south of the country. According to the UN, Libya ranked number 103 in terms of population among the 193 nations of the world in 2007. In that year approximately 4.2% of the population was over 65 years of age, 33.4% of the population was between 0-14 years of age and 62.4% was between 15-64 years. There were 107 males for every 100 females in the country in 2007 (Worldpress, 2012).

It is worth mentioning that the Libyan population enjoys a growth rate of 2.262% based on 2007 estimate, with the projected population estimated to be 6,886,000 by the year 2015. The general population density average in 2002 was 3 persons per sq km (5 per sq mile) (Advameg, 2007).

The official language is Arabic, although English and Italian are widely understood in the major cities. The literacy rate (that is, those of age 15 years and over who can read and write).(CIA, 2008).

3.3.4 Time and Business hours

Libya is two hours ahead of Greenwich Mean Time (GMT+2) and seven hours ahead of New York time. Business hours from Sunday to Thursday are eight hours a day, starting at 7.30 a.m. Friday and Saturday are days of rest for all (Ham, 2002).

3.3.5 Currency

The unit of currency is the Libyan Dinar (LYD) which is equal to 1000 Dirhams. It is issued by the central Bank of Libya. The Dinar's exchange rate (value) is tied to a basket of currencies containing those having Special Drawing Rights (SDRs). LYD has a value of approximately 1.30 US dollars (CBL, 2007).

3.4 Economic Background

The main sources of Libya’s income are oil and natural gas, followed by gypsum and iron (gasandoil.com, 2007).

According to the U.S. Department of State, oil and gas accounted for approximately 98% of Libya's export revenue in 2012, 75% of its government receipts and 25% of its gross domestic product. According to the *Oil and Gas Journal* (OGJ), the proven crude oil reserves were 48 billion barrels (as of January 2013), the largest endowment in Africa and among the ten largest globally. 80% of Libya's proven oil reserves are located in the Barqa region in the eastern half of Libya (EIA, 2013).

Libya adopted economic reforms in response to international pressure and, in conjunction with the lifting of Unaided Nation (UN) sanctions in September 2003 (particularly with the increasing potential of the oil sector), worked towards transforming its socialist-oriented economy to a more market-based model through applying for WTO membership, reducing subsidies and implementing a privatisation strategy (CIA, 2013). Libyan economic policy has, in recent times, focused on developing non-oil manufacturing such as iron, steel and other sectors in order to reduce the country's heavy dependence on oil (freegk.com, 2013).

It is very difficult to separate an assessment of Libya's economy from Libya's political ideology during the rule of the Gaddafi regime. The regime authorities were involved in the day-to-day operations in terms of changes in responsibilities or authorised budgets, organisational structure, location or site, employment conditions and personnel and management appointments. This all led to a state of instability causing a reduction in productivity and raising the cost of products. There were also continual changes in government and institutional laws, rules and regulations which, in turn, affected the stability of the Libyan organisations that were controlled completely or in part by the state (units such as iron and steel manufacturing, the aviation industry and other industries) (Ahmad, 2013; Shihub, 2009).

3.4.1 Overview of the Economy

The economy of Libya relies heavily on the exploitation of crude oil which accounts for about 95% of Libya's foreign currency earnings, about 25% GDP, and 60% of public sector wages. The non-oil sector accounts for more than 2% of GDP. This sector has developed from processing mainly agricultural products to include the production of petrochemicals, iron, steel and aluminium. Substantial revenues from the oil sector coupled with a small population give Libya one of the highest

per capita GPDs in Africa (IndexMundi, 2007). Thus, it seems clear that there is now more emphasis on diversifying the country's financial resources by developing the non-oil manufacturing and construction sectors, especially the activities which are related to international commerce and aviation.

The Libyan economy was affected by the Libyan people's uprising against the Gaddafi regime and, at that time, the Libyan oil and natural gas exports suffered a near-total disruption (EIA, 2013).

3.5 The Social and Cultural Structure in Libya

Libyan social life during the reign of King Idris (who ruled Libya after independence from the time of the British Mandate until the military coup by Gaddafi in September 1969) followed the common Islamic traditional mode of living. Such a traditional lifestyle, tribal-based and religious, was part of every aspect of the regime and also influenced the way in which policy was formed by the government.

Such a traditional lifestyle was not able to continue unaltered as tribal and village social structures were affected by various pressures. Rural people started to take on a modern lifestyle as the country underwent economic changes. Consequentially, rules and values started to change as materialism and wealth prevailed (Barakat, 1993).

Nevertheless, social life was noticeably more conservative when compared to other countries in the Arab world despite the government’s continuous efforts to alter Libyan society after the discovery of oil, and when revolutionary ideas were spreading in the period following the 1969 coup (Obeidi, 2001; El-Fathaly and Palmer, 1980). This view was also held by Jodie and Gorrill (2013) who argued that, in Libya, as a Muslim state, the heritage of Islam is deeply rooted in the character of the Libyan people; that it is an integral part of daily life and that Islamic rule pervades Libyan culture and customs, providing the structure for individuals' behaviour in both social and business contexts. Therefore, they recommended that companies who plan to invest in Libya should respect this fact, particularly in the area of dress, language and behaviour.

Loyalty to the family and to the tribe is deeply rooted in Libya and the tribal system is still strong in society despite the government’s efforts to weaken its

role. The former government realised the importance of such a role in supporting its policies and, when implementing certain programmes, the government ensured that they did not negatively impact upon the role of the tribes (Ahmad, 2013; Obeidi, 2001).

3.6 Infrastructure

Infrastructure sectors discussed in this study include transportation, ICT, energy and the labour force.

3.6.1 Transportation

The transportation sector in Libya is quite developed. There are two national airline companies: Libyan Airlines and Afriqiyah Airways. In addition, there are many private airlines of which the most popular is the Al-Buraq Airlines. Foreign airlines link Libya with almost all the major cities in the world, by daily and weekly flights. Additionally, domestic flights are available between Tripoli and all the major cities. Frequently, taxis as well as bus services (both charging reasonable prices) provide transport around all the regions in the country as well as to neighbouring countries. Nevertheless, this sector faces a number of problems and obstacles. One major problem is the quality of air transportation. Libya ranks very low among the countries surveyed on air transport quality in 2013 ranked 129th. (The Africa Competitiveness Report, 2013).

In order to cope with these problems and barriers the Libyan government employed programmers to work on the further development and maintenance of Libya's air transport industry (Porter, 2006).

Building a new international airport in the Libyan capital started in September 2007 and was expected to welcome over 20 million travellers a year. Two billion euro was earmarked for the modernisation of other airports in the desert country. These new international airports will help to create a fundamental change in Libyan air transportation and will attract and develop air travel and cargo movement between Libya and the rest of the world. Work also also started in establishing and maintaining Libyan local road networks and the sea ports (LGPC, 2008).

3.6.2 Information Communication Technology (ICT)

Almost all communications' services are available in the country, including mail, telephone and cordless communications. It is possible to dial almost all local

and long distance calls directly (without operator assistance). Mobile phones and internet services were introduced into the services' network in about 1999 to cover all locations in Libya.

Nonetheless, compared with other countries in the region, the Libyan ICT system needs to achieve substantial improvement. At times, Libya still suffers from a lack of speed in internet services and some chronic problems in the mobile phone network performance. Public telephones are in short supply. The mail services are now generally well organised but in some village areas they are not well organised and this sector is still under development.

Consequently, the Libyan government is implementing an expansion strategy to extend a wide range of ICT services to the whole nation. It began taking the first steps towards the development of this sector by setting up a plan to spend 10 billion USD on ICT infrastructure over the next 15 years (AIN, 2007).

Heading the Libyan delegation, Deputy Minister for Communications and Informatics asked for ITU's **(**International Telecommunication Union, ITU is an agency of the United Nations (UN) whose purpose is to coordinate telecommunication operations and services throughout the world) support in preparing a master plan to modernize ICT infrastructure in Libya to "not only world class level, but to world-leading standards." He said, "The Libyan ICT sector poses several opportunities as well as challenges that can potentially result in significant economic growth, job creation, and transformation of government services, among other possible impacts." The Libyan government has laid down a timeframe of two years to reach its objectives of modernizing the ICT sector. www.itu.int/net/pressoffice/ Last accessed 31/05/2015.

3.6.3 Energy

The main sources of energy in Libya are oil and gas. Libya depends on its own resources of these materials to satisfy the growing need for energy consumption. The Libyan government owns a national company called the General Electrical Company OF Libya (GECOL) which deals with all power supply operations. Compared to other countries in the region, the price of energy in Libya is very cheap. For example, the cost of one litre of diesel or petrol is 150 dirham which equals approximately six pence in British currency and it costs less than one penny for one kilowatt hour of electricity.

Libya's estimated total energy consumption for 2004 was 0.16% and 0.20% in 2008 of the world's energy consumption. These statistics include petroleum, dry natural, gas, coal, net hydro, nuclear, geothermal, solar, wind, wood and waste electric power. It is the fourth largest producer of electricity and the second largest consumer of power in Africa relying on an electric power production capacity of about 4.7 gigawatts (GW). In 2004, it generated 19.4 billion kilowatt-hours (Bkwh) from thermal power stations that used locally produced oil and gas. Libya had an average consumption of about 18.1 Bkwh of electricity (EIA, 2008). Libya's demand for electric power has increased rapidly over the last few decades which has resulted in the need for doubling the power generation capacity; in 2010 the demand was at 5.8 GW, and for 2020 the demand is forecast at 8 GW. Currently, Libya's power grid consists of around 8000 miles of 220-kV lines and 13000 miles of 66kV and 30kVlines. Libya is also looking at increased links with Tunisian and Egyptian power grids (GECOL, 2008).

3.6.4 Labour force

The labour force in Libya comprises about 1.3 million workers. About 31% of the work force is in industry, 27% in the services, 24% in government and 18% in agriculture. While official figures put the unemployment rate at 13%, unofficial estimates place the real rate between 35% and 40%. Foreign workers represent a significant percentage of the Libyan labour force, particularly in the services' industries and in manual labour jobs (U.S Commercial Services, 2007). Although the Libyan labour force has a good level of education and high literacy rates, there is a shortage of the more advanced skills in the job market (Porter, 2006). In order to cope with this shortage, the Libyan Government decided to develop the education and training system to meet Libya's long and short-term strategies and, as a consequence, significant investment in the education sector has taken place in recent years. There is a significant increase in the number of students, schools, teachers and classes at all levels of education in the country. The government has also adopted a new policy to allow the education and training of their people abroad, namely in the UK, United States, Germany and France.

3.7 Government Policies towards Multinational Companies

Libya is becoming one of the important and emerging markets in the world after the suspension of UN sanctions in 1999 and the subsequent lifting in 2003, coupled with the sustained recovery in oil prices. Libya is emerging as a market

with immense potential creating renewed interest amongst investors in investment circles. Although the degree of openness of the Libyan market remains comparatively limited, there are a number of encouraging signs that the government is pursuing a more conciliatory approach towards foreign companies. However, the state of the country presently is such that no one is sure of the systems currently in operation, in particular no-one is sure of the new systems of the current temporary Libyan government.

In fact, since 1997, the Libyan government had adopted a new reform agenda to make its investment climate more attractive through the promotion of a more favourable legal and institutional framework. Moreover, in order to improve upon the convoluted bureaucratic procedures that previously existed in Libya and which faced foreign companies when entering the country, the government had established two One-Stop Shop Services. The first is located in the General Board of Tourism and Traditional Industries and deals with tourism (travelling) projects. The second is located in the Libyan Foreign Investment Board (LFIB) and deals with other activities such as matters pertaining to industry and agriculture. According to Otman and Karlberg (2007), the One-Stop Shop Services provides all the services required by foreign companies and includes the labour force office, information on, and assistance with, customs' duty and immigration and passports, and assistance with the tax system. The One-Stop Shop also deals with:

- License and permit procedures.
- Export and import procedures.
- Import of foreign manpower procedures.
- Amendments and changes introduced to the project procedures.
- Ownership and renting of real estate procedures.
- Transfer of dividends' procedures.
- Complaint procedures.

3.7.1 Regulations and Investments' Incentives

1. Regulations

Several laws and resolutions have been enacted and promoted in order to encourage investment in Libya since 1997. These laws have been designed to guarantee investors' as well as government's rights. In accordance with the development levels that have been attained and in order to correspond to the government's aspirations and the investors' needs, these laws have been frequently amended and improved.

The investment environment and regulations in Libya have undergone many changes since the beginning of 1997. In 1997, Law No.5 for the year 1997, (Law No.5 1997) was enacted and in 2004 Law No 7 (Law No.7 2004) Concerning Encouragement of Foreign Capital Investment was enacted by the People's Congress (GPC). Law No.5 was amended by Law No.7 for the year 2003 (Law No.7, 2003). In 2004, the General People's Congress (GPC) enacted Law No.7 for 2004) regarding tourism in order to organise the Libyan tourism sector and related investments such aviation with respect to the tourism. In addition to these laws, the General People's Committee of Libya issued several resolutions in order to facilitate the implementations of these laws by the investors such as Decrees No.21 for year 2002 (No.21, 2002), 138 for the year 2004, (No.138, 2004), 13 for the year 2005, (No.13, 2005), 118 for the year 2005 (No.118, 2005) and Decree No.443 of 2006 (No.443, 2006).

Under the provisions of the aforementioned laws, the 'Libyan Foreign Investment Board (LFIB)' and the 'The General Board of Tourism and Traditional Industries' were established. Additionally, as stated in Article 1 of Law No.5 of 1997 (No.5, 1997) and its amendments in Law No.7 of 2003, (No.7, 2003). Regarding the Encouragement of Foreign Capital Investment and also in Article 2 in Law No.7 of 2004, (No.7, 2004) regarding tourism, laws were enacted to achieve the following objectives:

- The transfer of modern technology and technical expertise
- The exchanging of know-how in different economic fields and activities
- The diversification of national income sources

- The creation of new employment opportunities and the provision of advanced technical training for nationals
- The identification of the civilization and historical background of the Libyan people and maintaining, developing, promoting and protecting the tourist sites and utilities as well as providing entertainment and travel possibilities in general and in practice for nationals and tourists.
- To contribute to the development of national goods and services to assist in their entry into international markets.
- To implant social correlations between the individuals of the Libyan society and to enhance the operations and human relationships with the world's peoples.
- To contribute to economic, technical and social development.

2. Investments' Incentives

There are major incentives for tourist projects in general and the air transport sector in particular based on the linkage between the two. As stated in Law No 7 (Law No.7, 2004) regarding tourism, and with respect to the incentives given in Law No 5 (Law No.5, 1997) concerning the encouragement of investment of foreign capital, tourist projects are exempted from the following taxes and levies :(tax is customs fees and the levies any other additions fees like great manmade river fees and Jihad fees, etc..)

- Customs duties on construction materials, tools and equipment, furniture, tourist transport and on the different types of equipment as technical equipments (for example) necessary to construct and operate tourist utilities and projects.
- Any other exemptions and incentives to be proposed by the General's People Committee for aviation, with any decision that shall be issued with respect thereto by the General People's Committee.

Moreover, the main guarantees that are provided by the Libyan government to foreign companies (as mentioned in Law No.5 of 1997 (Law No.5, 1997) and its amendments in Law No.7 of 2003, (Law No.7, 2003) regarding the encouragement

of the investment of foreign capital without prejudice to the guarantee in Law No.7 of 2004, (Law No.7, 2004) regarding tourism and aviation) include the following:

- Net profits and dividends are freely transferable.
- Expatriate personnel can be freely employed in the absence of Libyan substitutes.
- Bank accounts in convertible currencies can be freely opened.
- Ownership of the project may be transferred in whole or in part to another investor.
- The investor can freely re-export his invested capital.
- Guarantees and protects the inventor against nationalisation, dispossession, seizure, expropriation or any other action of a similar nature.
- Establishment a One-Stop Shop for investors that provides all the required services, including the processing of applications and the granting of licences and permits.

3.7.2 Volume of Private Foreign Companies' Investments

According to the LFIB report (2007), 168 projects were approved by the Libyan authorities for the period from 1 January 2000 to the end of May 2007, excluding oil and gas sector projects. The total estimated cost of these projects was LYD 17,147 billion, which is equivalent to USD 10,990 billion; part of these costs being investments of foreign capital equal to LYD 14,288 billion and representing 83% of the investment in these projects. These projects can be divided into three groups in terms of completing their registered procedures and entering into operation in the country:

- 58 projects in the stage of finalizing the procedures for registration in the Investment Register and obtaining a licence for starting construction in different sectors, of which 39 are projects in industry, 5 are projects in services, 4 are projects in the area of health and health services, 8 are projects in real estate investment and 2 are projects in airport construction.

- 55 projects are finalizing the procedures and are entering into the construction stage, of which 36 are projects in industry, 6 are projects in the area of health and health services, 11 are projects in services and 2 are projects in real estate investment.

- 55 projects were completed in the services' sector, 8 projects in the area of health and health services, 2 projects in agriculture and 1 project in the tourism sector (Sidibanor resort located nearly 30km east of Tripoli).

It is worth noting that only two projects in the aviation sector (two airport contracts) and only one project in the tourism sector have been approved by the Libyan government out of the 168 projects during the aforementioned period.

3.7.3 Modes of Entry into the Libyan Market

The sectors of transportation, tourism and aviation in general and technology in particular will introduce the formats that foreign companies may adopt when deciding to enter the Libyan market; they are likely to focus on modes that are appropriate with technology. Foreign companies are allowed to conduct their business activities in Libya under the following formats:

(1) Representative Office

A foreign company is permitted to expand its business activities into Libya by opening a representative office subject to the conditions that are stated in the LGPC decree No.8 of 2005. For example, a company has to open an account with a minimum of 50,000 LD in one of the commercial airports that operate in Libya.

Opening a representative office may be the simplest way to enter the Libyan market for companies seeking to establish a legal presence and to begin testing the marketplace, while in the process of establishing a more substantial presence.

(2) Joint Venture

A joint venture is another business operation that may be used by a foreign company for its business activities in Libya. The establishment of joint ventures (Joint Stock Companies) in Libya is regulated by Law No.65

of 1970, as amended by Law No.21 of 2000. Foreign ownership in these joint venture companies can be up to 65%. This LGPC decision does not apply to companies coming to Libya under the terms of Law No.5 of 1997, (Law No.5, 1997).

Under these regulations, foreign companies are allowed to participate in most of Libya's economic activities such as in banking, tourism, agriculture, construction, aviation and the technology industry. Foreign companies that prefer to enter the Libyan market using these regulations are required to set up a minimum of 1 million LYD as capital investment and the Libyan partner must hold a minimum 51% of the total company's capital. Also, the manager of the company must be a Libyan national. The LGPC Resolution No.443 of 2006 (Law No.7, 2004) gives foreign companies that intend to use joint venture as a mode of entry to the Libyan market the following advantages and incentives:

- The right to lease land in Libya and to build factories and workshops that are necessary for the company's operation.
- The right to access financial and fiscal incentives from Libyan airports.
- The right to import foreign labour in order to serve the company's projects provided that such expertise is not locally available in Libya.

3.8 The Aviation Sector

Aviation is broadly grouped into three classes: general aviation, air transport aviation and military aviation. General aviation comprises all aviation that is not included in military or air-transport aviation. Military aviation includes all forms of aviation concerned with military activities, and air-transport aviation is primarily the operation of commercial airlines essentially as a public utility for the movement people and goods.

There numerous jobs that are created by airlines and the airport industry which are not involved in actual aviation at all, but which would not exist without the airlines and the airport industry. These include jobs in sightseeing/tours, hotels and restaurants. Such jobs are not only caused because of the number of

travelling passengers but also because of the vast amount of airport employees (Henderson, 1999).

Civil aviation refers to planes of any kind and of any size. Furthermore, aviation is concerned with everything to do with aeroplanes such as airports, airlines of any kind (flag carrier, commercial, charter, cargo), control towers, runways, passengers, personnel (pilots, flight & ground engineers, and all the staff working in airlines and airports). It also includes any additional works/businesses belonging to the airports or/and airlines such as hotels, parking spaces, bus and train stations, taxis, etc. Airports are vital national resources. They serve a key role in the transportation of people and goods and in regional, national, and international commerce. They are where the nation's aviation system connects with other modes of transportation and where federal responsibility for managing and regulating air traffic operations intersects with the role of state and local governments that own and operate most airports.

Research is necessary to solve common operating problems, to adapt appropriate new technologies from other industries, and to introduce innovations into the airport industry.

There is information on nearly every subject of concern to the airport industry. Much of it derives from research or from the work of practitioners faced with problems in their day-to-day work. To provide a systematic means for assembling and evaluating such useful information and to make it available to the entire airport community.

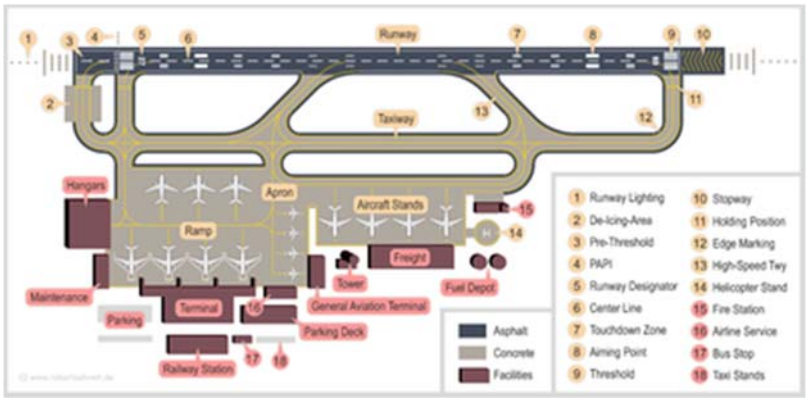

Figure 3-1 Sample infrastructure of a typical airport

3.8.1- The Libyan Civil Aviation Organization (LCAO)

The Libyan Civil Aviation Organization has the supreme national responsibility for establishing uniform aviation operational standards including those relating to implementing international safety regulations for aircraft safety and airworthiness, and the licensing of pilots and all aviation staff. Its strategic objectives are to provide safe, secure, sustainable and efficient global civil aviation, to minimize aviation's adverse effects on the environment, and to strengthen the laws governing international/regional civil aviation in Libyan airports (LCAO, 2013).

3.8.2- International Civil Aviation Organization (ICAO)

One of the most important international organizations within the aviation sector is the International Civil Aviation Organization (ICAO) which promotes the safe and efficient development of international civil aviation (Wallis, 2001). This is the specialized agency of the United Nations, established in 1947, with its headquarters in Montreal. The objective of the ICAO (which has international members from 190 countries such as the Libyan Civil Aviation Organization) is to encourage the orderly growth of international civil aviation (ICAO, 2011).

3.8.3 Information Technology Challenges in Libyan Airports.

In any business information technology is of extreme importance. Information is business and without information no business is successful. A successful businessman always analyses all the information which is relevant to his business in order to arrive at decisions that will assist in maximising his profits. In this age of fast growing information technology where information stored on millions of servers the world over is available on a desktop at the click of a button, knowing where to find information and how to use the information has become more important that the information itself.

3.9 The Libyan airports

Country	Location	Name	ICAO	IATA
Libya	Al Bayda	La Abraq/(el) Beida	HLLQ	LAQ
Libya	Benghazi	Benina	HLLB	BEN
Libya	Ghat	Ghat	HLGT	GHT
Libya	Hon	Hon	HLON	HUQ
Libya	Kufra	Kufra International	HLKF	AKF
Libya	Marsa Brega	Marsa Brega	HLMB	LMQ
Libya	Misurata	Misurata	HLMS	MRA
Libya	Sebha	Sebha	HLLS	SEB
Libya	Tripoli	Mitiga	HLLM	MJI

Libya	Tripoli	Tripoli International	HLLT	TIP
Libya	Zwara	Zuwarah	HLZW	WAX

Table 3-1 The Libyan airports (Source: LYCAA)

Tripoli airport	International Airport
Benghazi airport	International Airport
Sabha airport	International Airport
Koufra airport	International
Ghat airport	International
Ghdames airport	Civil airport
Zwara airport	Internal
Labreq airport	International
Meateqa airport	Air Force Civil International Airport
Martuba airport	Air Force Civil Internal Airport
Houn airport	Air Force Civil Internal Airport
Tuobreq airport	Air Force Civil International Airport
Sarer airport	Air Force Civil Internal Airport
Mesrata airport	Air Force Civil International Airport

Table 3-2: Libyan airport names and their categories (Source: LYCAA)

3.9.1- Tripoli Airport – Libya Case Study 1

Tripoli International Airport (IATA) TIP /– HLLT ICAO (HLLT) is an international airport that serves Tripoli, Libya. It is operated by the Civil Aviation and Meteorology Bureau of Libya and is the nation's largest airport. It is located in the town of Ben Ghashir 24 kilometres (15 miles) south of the city centre of Tripoli. The airport is a hub for Libyan Airlines, Afrigyah and Buraq Air.

With the closure of the National Terminal as part of the construction of the new airport, all flights, international and domestic, leave the airport from the main International Passenger Terminal. The terminal capacity is 3 million passengers a year. The airport handled 2.1 million passengers in 2007 and over 3 million passengers in 2008 (Gavlak, Dale 2010).

Two new terminals were due to be built which would bring the total capacity of the airport to 20 million. The first new terminal was due to open by March 2011 (Endress, Gunter 2008). But this terminal has not opened yet because of the civil war that is going on now.

Transport to and from Tripoli city centre usually involves taking a taxi or sharing a taxi. Tour operators offer coaches to and from the airport connecting it with numerous hotels in the city centre.

The airport has one main passenger terminal that serves international and domestic departures and arrivals. Check-in and arrival facilities for domestic flights are in the same building as the international terminal but in a different area. The terminal hall is a five-story building with an area of 33,000 square meters (360,000 sq. ft.) and is capable of handling three million passengers annually. Check-in facilities are all located on the ground floor. The departure gates are located on the floor above as is also the duty-free section. Additionally, there is a prayer room and a first-class lounge which serves business class passengers and passengers in classes above business class for almost all the airlines operating from the airport.

The airport operates 24 hours a day. There is no overnight accommodation at the airport but there are plans to build an airport hotel to serve passengers who are in transit. A restaurant can be found on the fourth floor of the international terminal.

The airport's cargo-handling facilities include cranes, heavy fork lifts, roller pallet lifts and conveyor belts. There is twenty-four-hour fire protection at the airport with 112 trained personnel working at the fire station.

In September 2007 the Libyan government announced a project to upgrade and expand the airport. The eventual total cost of the project, contracted to a joint venture between Brazil's Odebrecht, TAV Construction of Turkey, Consolidated Contractors Company of Greece and Vinci Construction of France, was to have been LD2.54 billion (US$2.1 billion) (Gavlak, Dale 2010).

The project was to construct two new terminals at the airport (an East Terminal and a West Terminal) on either side of the existing International Terminal. Each of the new terminals was to have been 162,000 square metres (1,740,000 sq ft) in size, and collectively they would have had a capacity of 20 million passengers and a parking lot for 4,400 vehicles. The French company, Aéroports de Paris Engineering, designed the terminals which were expected to serve 100 aircraft simultaneously (LYCAA. Retrieved 1 November 2006).

Location: 15 miles (24km) in the town of Ben Ghashir south of the city centre of Tripoli, Libya

Code: (IATA) TIP /– HLLT ICAO (HLLT)

Commercial Opening: 1956

Terminals: 1

Operational Hours: 24-hours all year round

Runways: Two

Libyan Rating (By Passengers): 1st

Employment (Site): 987

Key Players: Operated by the the Civil Aviation and Meteorology Bureau of Libya Owners: Civil Aviation and Meteorology Bureau of Libya Libyan government Traffic: Passengers: 3 million a year (Libyan Civil Aviation Authority, 2011).

3.9.2- Benghazi Airport – Libya Case Study 2

Benghazi (Benina) International Airport (IATA: BEN, ICAO: HLLB) serves Benghazi, Libya. It is located in the town of Benina, 19 kilometres (12 miles) east of Benghazi, from which it takes its name. The airport is operated by the Civil Aviation and Meteorology Bureau of Libya and is the second largest in the country after Tripoli international Airport. Benina International is also the secondary hub of both Buraq Air and the flag carrier, Libyan Airlines (Libyan CAA, 2011).

A new terminal with a capacity of 5 million passengers will be developed north of the existing runway at Benina International (Benghazi) under a 720 million LYD (€415 million) first-stage contract awarded to Canada's SNC-Lavalin. The final cost is estimated at 1.1 billion LYD (€630 million). As with Tripoli International Airport, the new terminal was designed by Aéroports de Paris Engineering. Preliminary work and site preparation has started, but it remains unclear as to when the terminal will be open for operation (Endress, Gunter 2008).

The contract for Benina International Airport includes the construction of a new international terminal, a runway and the apron. The new airport is part of an extensive new infrastructure programme being undertaken by the government of Libya throughout the country, but nowadays the project are delayed because of the country situation.

Location: Benina International Airport it is located in Town of Benina,

Code: (IATA) TIP /– HLLB ICAO (HLLB)

Commercial Opening: 1958

Terminals: 1

Operational Hours: 24-hours all year round

Runways: Two

Libyan Rating (By Passengers): 2nd

Employment (Site): 634

Key Players: Operated by the CA and Meteorology Bureau of Libya Owners: The Civil Aviation and Meteorology Bureau of Libya, Libyan government Traffic: Passengers: 1.2 million a year (Libyan CAA, 2011).

3.10 Libya's International Traffic

Libya's international traffic levels fell by more than one million passengers in 2011 as compared to 2010. Over a six-year period, international traffic levels had been increasing while domestic levels have remained reasonably steady, with the highest traffic levels reached in 2006 and 2007.

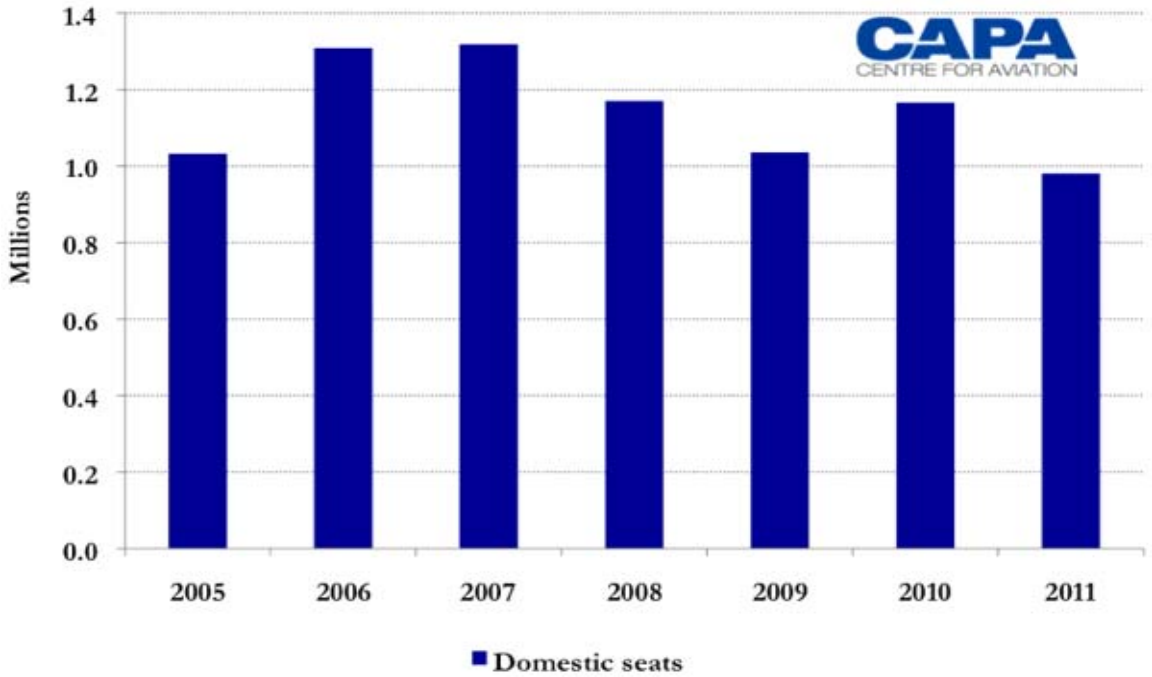

Table 3-3: Libya total domestic aviation seats: 2005 to 2011

Source: CAPA –. (Source: CAPA – Centre for Aviation & OAG facts).

Centre Libya's international traffic has been hindered by various sanctions throughout 2011 and up to now due to unstable situation.

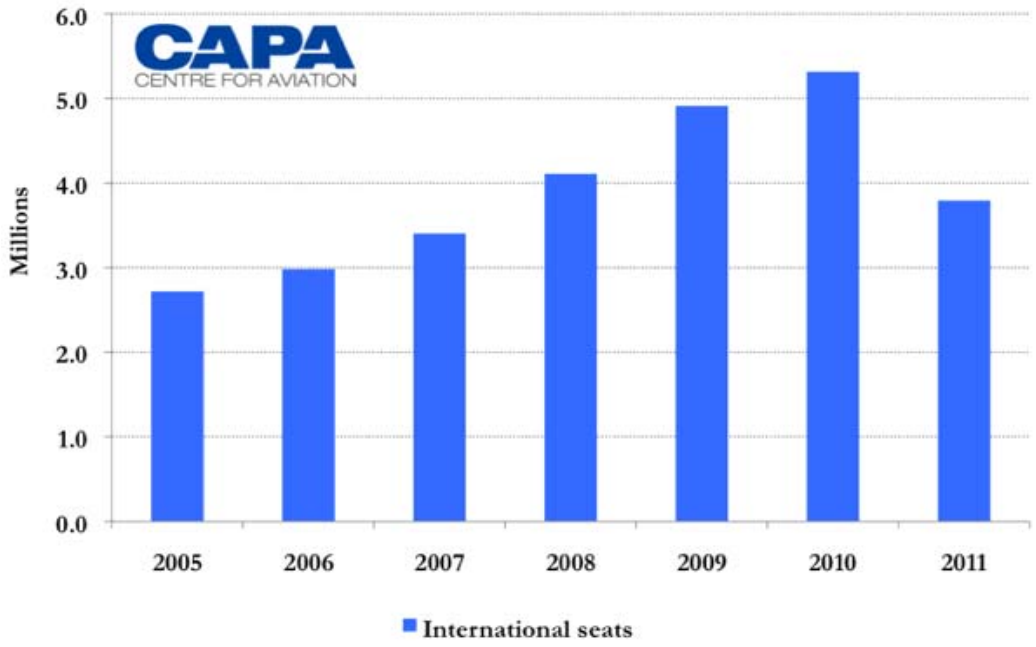

Table 3-4: Libya total international aviation seats: 2005 to 2011 (Source: CAPA – Centre for Aviation & OAG facts) Projected.

The resumption of air services after the civil war was deemed hasty by some and created concerns over safety and security. Pilots, cabin crew and aviation officials in Libya were concerned that the National Transitional Council (NTC) (under the guidance of the first interim Prime Minister, the second interim Prime Minister and, up to now, the interim Prime Minister) was endangering lives by resuming air services too quickly, as well as jeopardising Libya's commercial advantage by giving foreign carriers privileged access. In the weeks after the previous regime crashed, a small number of international carriers announced their intentions to resume operations. Included in these airlines were the EU carriers, bmi and Lufthansa. They joined other airlines that had already announced plans to resume services in addition to a handful of carriers that had been operating since before the liberation.

Airline	Departing point	Destin-ation	Resumption date	Frequency and aircraft
Turkish Airlines	Istanbul	Benghazi	13-Sep-2011	Daily, Boeing 737-800
Royal Jordanian	Amman	Benghazi	15-Sep-2011	Three times weekly, A319/E195
Turkish Airlines	Istanbul	Tripoli	24-Sep-2011	16 times weekly, 737-800
Malev	Budapest	Tripoli	23-Oct-2011	Five times weekly, 737-600
EgyptAir	Cairo	Benghazi Tripoli	01-Nov-2011 07-Dec-2011	Four times weekly, A320 15 times weekly, A320
Qatar Airways	Doha	Benghazi	01-Nov-2011	Four times weekly, A320
Tunisair	Tunis	Tripoli	02-Nov-2011	twice daily, A320
Alitalia	Rome	Tripoli	02-Nov-2011	Four times weekly, MD-80
bmi	Heathrow	Tripoli	21-Nov-2011	Daily, A320
Air Maroc	Casablanca	Tripoli	21-Nov-2011	Three times weekly, 737
Royal Jordanian	Amman	Tripoli	24-Nov-2011	Four times weekly, A320/A321
Air Malta	Malta	Tripoli	28-Nov-2011	Three times weekly, A320
Lufthansa	Frankfurt	Tripoli	01-Dec-2011	Weekly, A320
Tunisair Express	Tunis-Sfax	Tripoli	21-Dec-2011	ATR72
Etihad	Abu Dhabi	Tripoli	"Soon"	Four times weekly, A330
Air France	Paris CDG	Tripoli	"When security is restored"	-

Table 3-5: International carriers (Source: CAPA – Centre for Aviation, Innovata & local reports)

International carriers which returned to Libya after the civil war plus those who indicated that they plan to return, but has been hindered by various sanctions since July 2014 and up to now due to unstable situation.

3.11 Chapter Summary

This chapter has outlined the significant attributes of:

- The business environment in Libya. It intended to highlight some of the economic developments that have taken place in Libya. A brief historical review of developments as regards business laws and regulations has been presented. A particular emphasis has been given to those laws which relate to foreign investments, with an emphasis on those currently in force in order to identify vital policy issues relevant to international commerce, tourism and air transportation. Hence, this chapter has provided an overview. It has given information on the geography of Libya and has highlighted the economic, legislative and regulatory business environment, focusing on the main guarantees and incentives that are provided to foreign investors and available modes of entry that exist to enter into the Libyan market. The main financial services and taxes relating to foreign investors were briefly outlined. Although the Libyan business environment has witnessed remarkable progress over the last decade in providing a sustainable and profitable environment for foreign investors, the current precarious conditions has marred this picture and current statistics may vary greatly from previous ones.

- The aviation sector in Libya. Aviation is broadly grouped into three classes: general aviation, air transport aviation and military aviation. General aviation comprises all aviation not included in military or air-transport aviation. Air-transport aviation is primarily the operation of commercial airlines essentially as a public utility for the movement of persons and commodities. Civil aviation refers to planes of any kind any size. Furthermore, aviation is concerned with everything to do with aeroplanes such as airports and airlines. The sector that comprises airports includes the following: control towers, runways, passengers, personnel (pilots, flight & ground engineers, and all the staff in airlines and airports) and any

additional works/infrastructure that belong to the airports or/and airlines. Airports are vital national resources. They serve a key role in the transportation of people and goods and in regional, national and international commerce. They are where the nation's aviation system connects with other modes of transportation and where federal responsibility for managing and regulating air traffic operations intersects with the role of the state and local governments that own and operate most airports.

Research in this area is necessary to solve common operating problems, to look at the adoption of appropriate new technologies from other industries, and to introduce innovations into the airport industry. This study takes Tripoli and Benghazi airports as its case studies. Airport administrators, engineers and researchers often face problems for which information already exists, either in documented form or as undocumented experience and practice. This information may be fragmented, scattered and unevaluated. As a consequence, full knowledge of what has been learned about a problem may not be brought to bear on its solution.

The next chapter will discuss the methodology adopted to achieve the aim and objectives of this study.

Chapter 4

Research Methodology

4.0 Introduction

This chapter aims at providing the appropriate research methodology in order to accomplish the objectives of the research, thereby answering all the research questions upon which this study is based. Research methodology is the use of any strategy, approach or tool that helps in data collection and in the analysis of the gathered data in order to answer the identified research questions (Chandler, 2006). Therefore, this chapter includes the research methodologies that were used to answer the research questions in this study alongside the rationale and usefulness of those strategies and methodologies in the context of this study.

4.1 Defining Research

According to Collis and Hussey (2009), methodology refers to the overall approach to the research process, from the theoretical underpinning to the collection and analysis of the data. Furthermore, according to Collis and Hussey (2009), research can have a variety of purposes that may include:

- Amalgamation and review of already available knowledge.
- Enquiring into existing problems.
- Suggesting sound solutions to those problems.
- Taking into consideration general problems.
- Creation of new systems that work better.
- Explaining a new phenomenon.
- Creating new knowledge, and
- An amalgamation or synthesis of any of the above purposes.

4.2 Type of Research

Research can be classified as exploratory, descriptive or exploratory/analytical research (Saunders et al., 2012). Exploratory research "aims to seek new insights into phenomena, to ask questions, and to assess the phenomena in a new light" (Ibid: 592). Collis and Hussey (2009) referred to exploratory/analytical research as research usually conducted on a research problem where there has been few or no earlier studies. Descriptive research is research that describes phenomena as they exist. Therefore, descriptive research seeks to find out what is happening and to obtain information on the characteristics of a particular problem. Analytical or explanatory research is a

continuation of descriptive research; it goes beyond merely describing characteristics to analysing and explaining 'why' or 'how' the phenomenon is happening (Ibid).

The present research is an explanatory and exploratory/analytical study whose aim is to identify and assess the possibility of improving the IT strategy in Libyan airports.

4.3 The Research Methodology Model

In the literature there are two main models for research methodology: the nested model and the onion model (Keraminiyage, 2013). In the nested model, there are three elements constituting research methodology: the research philosophy, the research approach, and the research techniques which are shown in Figure 4.1.

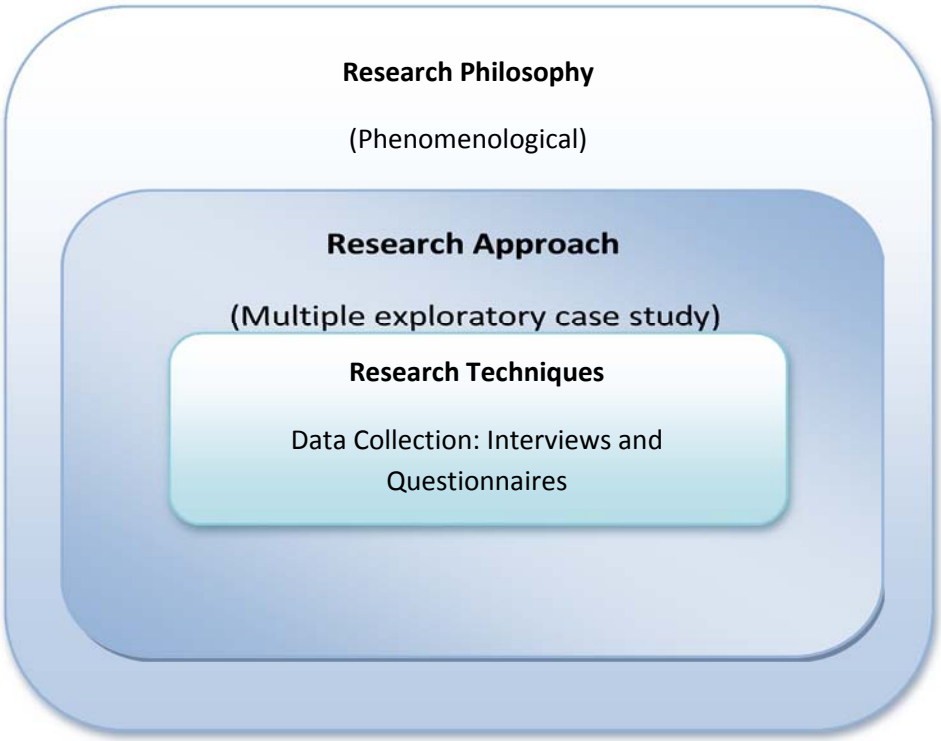

Figure 4-1: Nested research methodology approach (Source: Model adapted from Kagioglou et al., 2000)

Amaratunga et al. (2002) claimed that, although research is important in both business and academic activities, there is no consensus in the literature on how it should be defined. One reason for this is that research means different things to different people. However, from the many different definitions offered there appears to be agreement that research is a process of enquiry and investigation; it is systematic and methodical; research increases knowledge. Moreover, Amaratunga et al. (2002) added that research depends entirely on the quality of the investigation. The quality of any investigation is entirely based on facts, experience and data, concepts and constructs, hypotheses and conjectures, and principles and laws.

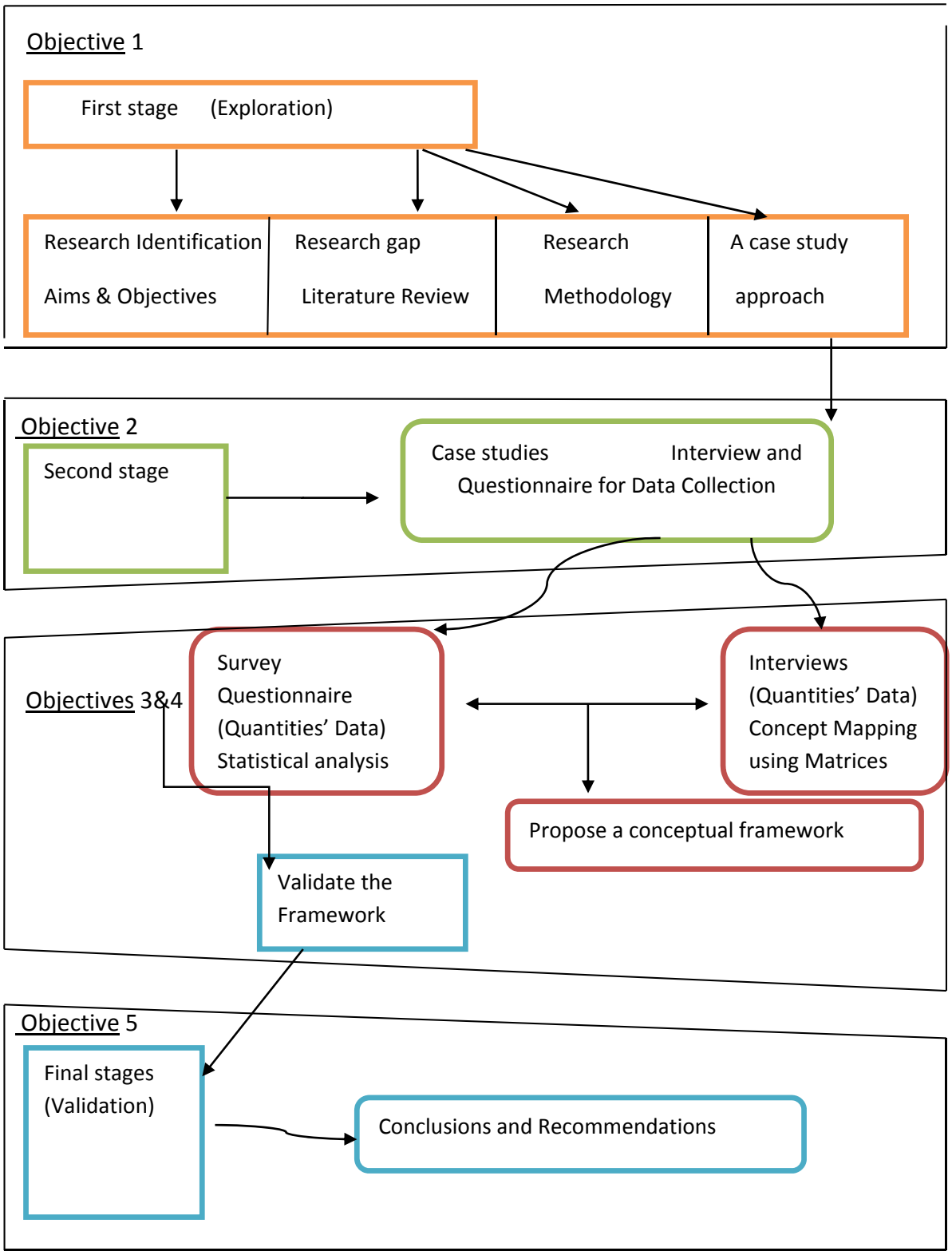

Figure 4.2: A Conceptual (Research) Framework.

4.4 Research Philosophy

The research philosophy concerns the researchers' thoughts and cognitive patterns and depicts the way a researcher approaches the research question which, in turn, leads to the specific way that the research is undertaken. The philosophy depends upon certain factors including the aim of study, the scope and objectives, the hypothesis and the research questions that are to be tested in the study, and the significance of the study for society (Saunders et al., 2012). Thus there is no specific procedure or rule that can be regarded as the best possible philosophy for undertaking research; it is rather a context and situation specific phenomenon (Yin, 2009).

There are two main research philosophies dominant in the literature: positivism and interpretivism or the phenomenological approach (Hussey and Hussey, 1997). Easterby-Smith et al. (2008, p57) described positivism research thus: "*The social world exists externally, and its properties should be measured through objective methods, rather than being inferred subjectively through sensation, reflection or intuition*". Positivists prefer using statistical analyses of data collected by means of large-scale empirical surveys (Amaratunga et al., 2002; Gummesson, 2000; Morgan and Smircuch, 1980).

Interpretivism is a phenomenon that is focused mainly on the specific way that people approach the world based on their previous experiences, using language as a medium of communication (Easterby-Smith et al., 2008). It is a subjective phenomenon that is based on factors such as awareness, depth of perception, an in-depth understanding of the phenomenon and interpretation based on personal experiences in order to answer what, why or how questions (Collis and Hussey, 2009). According to this philosophy, the researcher is a part of, and a participant in, the whole process of research and not an independent being, as thought by the positivism philosophy.

Based on the nature of this research which focuses on meaning rather than measurement and because the researcher wants to gather rich information from the points of view of the study participants (based on their experience) in order to investigate the possibility of adopting and implementing an IT Strategy in Libyan airports, therefore, the interpretivist philosophy has been adopted as the research philosophy.

An understanding of philosophical issues is very useful since they can help to clarify research designs and the methods by which data are collected and analysed. This study considers two distinct research philosophies, these being positivism and phenomenology.

These are the two philosophies which support management research. The key features of the positivist and phenomenological philosophies have been addressed by many researchers (see for example, Collis and Hussey, 2009; Easterby-Smith et al., 2008). Positivism is characterised by the requirement for the observer to remain independent from the subject being observed, and for the subject under analysis to be measured through some objective method. In addition, positivism proceeds through a theoretical framework, formulates a hypothesis through deductive reasoning, and then tests it. On the other hand, the phenomenological (interpretive) approach proceeds with data and generates theories through induction from data, stressing the subjective aspects of human activity by focusing on the meaning rather than on the measurement of social phenomena. Further, phenomenological research tries to understand and explain phenomena, rather than search for external causes or fundamental laws. As the aim of this research is to investigate the role of technology through an IT implementation strategy this demands focusing on subjective aspects, rather than on objective aspects and, hence, it can be said that this study leans more toward phenomenology.

4.5 Research Approach

According to Saunders et al. (2012), there are two main research approaches, the deductive and inductive approaches.

The deductive approach is a theory testing process which commences with an established theory or generalisation and seeks to establish, by observation, whether it applies to specific instances. This approach is used mostly with the positivism research philosophy.

The inductive approach is a theory building process, starting with direct observation of specific instances and seeking to establish generalisations about the phenomenon under investigation. It is more suited to a phenomenological research philosophy (Hyde, 2000).

Deductive approach	**Inductive approach**
Scientific principles	Gaining an understanding of the meaning humans attach to events
Moving from theory to data	A close understanding of the research context
The need to explain the causal relationships among variables	The collection of qualitative data
The collection of quantitative data	A more flexible structure to permit changes of research emphasis as the research processes
The application of controls to ensure the validity of data.	A realisation that the researcher is part of the research process.
The operationalization of concepts to ensure clarity of definition	Less concerned with the need to generalise
A highly structured approach	
Researcher independent of what is being researched	
The necessity to select samples of a sufficient size in order to generate a conclusion.	

Table 4.1: The major differences between deductive and inductive approaches (Source: Saunders et al., 2012)

Creswell (2009) stated that one of the key differences between these two approaches lies in how existing literature and theory are used to guide the research. The deductive approach is designed to test a theory. Thus, the literature is used to identify questions, themes and interrelationships before data are collected; whereas, the inductive approach builds a theory as the research progresses and themes are identified throughout the research process and the

literature is used to explore different topics. Table 4.1 illustrates the main differences between the inductive and deductive approaches according to Saunders et al. (2012).

Hussey and Hussey (1997) argued that a discussion on the different types of research philosophies and approaches allows the researcher to understand the best way to conduct his/her own personal research, but they also suggested that an individual should not feel too constrained when undertaking research; the researcher can move between an inductive and deductive approach.

However, Martin and Cepeda (2005) argued that there is no theory-free research and that all empirical work is based on some fundamental ideas. They noted that all researchers begin with some kind of conceptual framework (see figure 4.2) and that it would be impractical for them to engage in the research process without a framework or without a notion about the relevant concepts in the area of interest. Moreover, Sekaran (2009) and Saunders et al. (2012) suggested that a combination of deduction and induction is not only perfectly possible within the same piece of research, but that it is often an advantageous approach.

The one key difference between the deductive and inductive approaches is how existing literature and theory are used to guide the research. As discussed above, the deductive approach is designed to test a theory, therefore, the literature is used to identify questions, themes and interrelationships before data are collected. The inductive approach builds a theory as the research progresses; themes are identified throughout the research process and the literature is used to explore different topics (Creswell, 2009).

Accordingly, the researcher has chosen to combine the deductive and inductive approaches. A list of factors that is necessary to assess the viability of the adoption of Information Technology will be derived from the literature and then investigated in the case study institutions (deductive). Subsequently, the findings from the fieldwork (e.g. the analytical framework on the adoption factors of ITS in the Libyan aviation industry) will be incorporated into the existing theory (inductive).

4.6 Research Strategy

Saunders et al. (2012) defined research strategy as the plan that is utilised that aims at providing the ways in which to answer the research questions in order to satisfy the research objectives. Five main types of research strategies, as summarised in Table 4.2, were created by Yin (2009) thereby providing the three main conditions that may allow for the selection of a certain strategy which is appropriate for a specific study. The three conditions are:

- Type of research question.
- Researchers' control of behavioural events, and
- The focus being on present events as compared to past ones.

Strategy	Form of Research Question	Requires Control of Behavioural Events?	Focus on Contemporary Events
Experiment	How, Why?	Yes	Yes
Survey	Who, What, Where, How many, How much?	No	Yes
Archival analysis	Who, What, Where, How many, How much?	No	Yes/No
History	How, Why?	No	No
Case study	How, Why?	No	Yes

Table 4.2: Relevant situations for different research strategies (Source: Yin, 2009, p. 8)

The case study method, as identified by Yin (2009), is the most suitable strategy for answering "how" or "why" questions. It helps to understand what the problem is and how and why it occurred and how it is to be solved. If it is not

possible for the researcher to control events and the study is to be mainly focused on contemporary events, then the case study is the best type of strategy. The present study focuses on research questions which include: Why do the airports in Libya need to adopt an IT system? Are the factors that enable the adoption of an IT system present in the airports in Libya? The event is contemporary and the researcher has no control over this phenomenon. Moreover, one of the strengths of the case study method is that it allows a researcher to use a variety of, and a combination of, sources and a number of different data types as a part of the study (Denscombe, 2003). It is also the most adopted strategy when the research is qualitative in nature (Brotherton, 1999).

Therefore, based on the above discussion, the researcher adopted the case study strategy for this research; firstly, because it is the most suitable and appropriate research strategy for this research and, secondly, to gain a greater understanding of the information required to investigate the factors that will encourage the Libyan airports/aviation administration to adopt IT implementation.

4.7 Single Case Study or Multiple Case Studies

Case studies can be carried out in one organisation (a single case study) or in more than one organisation (multiple case studies). Yin (2009) stressed that the single case study is an appropriate strategy to use when the case represents an extreme or unique case. Voss et al. (2002) believed that, although a single case study offers greater depth of understanding, it has limitations on the generalizability of the conclusions drawn. Yin (2009) argued that researchers who prefer to adopt a single case study as a research strategy need to have a strong justification for this choice. Yin (2009) and Lee (1992) observed that multiple case studies are more common and are generally used to replicate findings or to support theoretical generalisations. Indeed, multiple case study research increases external validity and helps to protect against observer bias (Voss et al., 2002; Leavy, 1994).

Furthermore, there are two types of design for a multiple case studies' strategy: multiple holistic and multiple embedded case studies (Yin, 2009). *Multiple holistic case studies* involve a single unit of analysis. *Multiple embedded case studies* include multiple units of analysis.

In this study, multiple embedded case studies have been selected. This will involve multiple realities being derived from top management, middle management and low levels management responsibility which could provide data to enrich the findings. As a result of these considerations, it was decided that the appropriate research design for the present study would be multiple embedded case studies (in Tripoli and Benghazi airports) replicating the same phenomena under different conditions.

4.8 Research Method

In social sciences, the positivist and interpretivist philosophies are represented by two main types of research method, quantitative and qualitative (Easterby-Smith et al., 2008).

Qualitative	**Quantitative**
Uses small samples	Uses large samples
Concerned with generating theories	Concerned with hypothesis testing
Data are rich	Data are highly specific and precise
Reliability is low	Reliability is high
Validity is high	Validity is low
Generalizes from one setting to another	Generalizes from sample to population

Table 4.3: Key features of qualitative and quantitative research (adopted and modified from Hussey and Hussey, 1997)

Quantitative research is one that is supported by the positivist school of thought and is all about numbers and digits and measuring items in a quantitative way (Collis and Hussey, 2009; Sutrisna, 2009; Easterby-Smith et al., 2008). Quantitative research aims at providing answers for the how much, how often, how many, kind of questions that need to be answered in a measurable form, and in the form of numbers and digits (Gummesson, 2000) whereas qualitative research, which is connected with the interpretivist philosophy, is based upon the gathering and interpretation of data which is presented in the form of words rather

than digits and numbers (Bryman and Bell, 2007). This type of research has its main focus on processes rather than on numbers and formulas (Denzin & Lincoln, 1998) and is able to provide an in-depth and detailed analysis and interpretation of the deeper meanings of a phenomenon under study (Strauss and Corbin, 1998). Table 4.3 lists some of the key features of qualitative and quantitative research concerning data collection methods, as given by Hussey and Hussey (1997).

The research philosophy of this study is interpretivism (which focuses on meaning rather than numbers). Additionally, this research is interested in a deep understanding of the possibility of adopting an IT system in the airports in Libya.

4.3.1 Rationale for Adopting the Case Study Research Approach

The case study is a research strategy. There is no standard definition of a case study. Yin (2009) defined a case study as an "empirical inquiry that investigates a contemporary phenomenon within some real-life context" when the boundaries between phenomena and context are not clearly evident. Moreover, Benbasat et al. (1987) stated that a case study examines a phenomenon in its natural setting and employs multiple methods of data collection to gather information from one or a few entities (people, groups, or organisations). Yin (2009) argued that the case study approach is an effective research strategy, when in-depth information is required. In addition, Amaratunga et al. (2002) stated that case studies are tailor-made for exploring new processes or behaviours or those areas which are little understood. Furthermore, Amaratunga and Baldry (2001) asserted that a very important advantage of case study material lies in the richness of its detailed understanding of reality. Yin (2009) noted that the case study methodology involves the use of multiple sources of data to gain the fullest understanding and to improve validity through triangulation. Moreover, the case study strategy can combine qualitative and quantitative research; the advantage of using this method is to gain the validity of the research (Jick, 1979). One of the limitations of case studies is that the approach is time consuming and the data can result in massive and unreadable documents (Yin, 2009).

4.3.2 Selection of Multi-Case Study Approach.

Yin (2009) observed that case studies can be exploratory, explanatory, and descriptive and can, therefore, be useful in pursuing different types of research

questions. In this study the investigator will explore and recommend strategies to improve the IT strategy framework for Libyan Airports, and will use the case study strategy because the problem has not been defined, and there are few existing theories and little knowledge of the problem area.

The case study approach can be based on a single or multiple cases, and the decision on this must be taken before data collection (Yin, 2009). Vaus (2001) stated that a single case study is less compelling than multiple cases, although it is certainly appropriate when it presents a critical case that can test a well-formulated theory. In addition, it may be that the unique or extreme nature of the case may mean it is only possible to study a single case. However, the single case study does have a major drawback in terms of its reduced ability to generalise the results obtained to a wider population. Multiple case studies address this weakness because they have the advantage of replication logic. Moreover, multiple cases are often considered more compelling and robust (Yin, 2009; Amaratunga and Baldry, 2001).

Clearly, the use of multiple case studies adds much more credibility to any attempts to generalise, since there is more opportunity for the triangulation of findings. Moreover, if the subject being studied is complex, the use of several case studies will enable the researcher to collect a large variety of information regarding the topic, and will increase the understanding of the phenomenon. Therefore, as a means of exploring and recommending strategies to improve the IT strategy framework for Libyan airports, a multiple case study approach is selected.

- *Tripoli Airport – Libyan Case Study 1. (See Section 3.9.1)*
- *Benghazi Airport – Libyan Case Study 2. (See Section 3.9.2)*

4.14 Chapter Summary

This chapter has provided an overview of the research methodology. Based on the aim, objectives and research questions of this study, the interpretivism philosophy was chosen as the research philosophy and the deductive and inductive

approaches were selected and justified. A multi-case study approach was adopted as the strategy for this research. The data collection tool chosen were for the empirical (primary data) aspect, questionnaires and interviews face-to-face semi-structured interviews for the main source of evidence. Finally the data is to be analysed by using the thematic analysis.

Chapter 5

Data Collection

5.0 Research Techniques for Data Collection.

There are certain sources of data which include primary as well as secondary data and both forms can be utilized by the case study method. Secondary data is data that involves information that is already available in the form of documents, archives or any other form including reports, publications, books etc. This data may be available in hard copy or soft copy or on the internet. Primary data refers to the data that is gathered directly and is first-hand data which is collected with the help of interviews, observations, focus-group discussions and questionnaires (Collis and Hussey, 2009). It has been recommended by several researchers that the case study strategy must first take into consideration secondary data as a part of the literature review (Ghauri and Gronhaug, 2005; Churchill, 1999).

Yin (2009) has asserted that, within a case study approach there are six sources of evidence, these being: interviews, archival records, documentation, direct observation, participant observation, and physical artifacts. Data may be collected from primary or secondary sources. Primary data refers to the collection of data through interviews, direct observation, participant-observation, focus groups and questionnaires (Collis and Hussey, 2009; Saunders et al., 2012).

The various sources are highly complementary and a good case study will use as many sources as possible, since through these it is possible to collect primary and secondary data. Stake (1995) and Yin (2009) identified at least five sources of evidence in case studies. The following is not an ordered list, but reflects the research of both Yin (2009) and Stake (1995) and consists of primary and/or secondary data:

- Interviews: One of the most important sources of information in case studies; they should be undertaken by conducting a personal interview;
- Documents: Can be letters, memoranda, agendas, administrative documents, newspaper articles or any other document relating to the investigation;

- Archival records: Includes service records, organisational records, lists of names, staff and payroll records, old correspondence and other such records;
- Direct observations: A way of collecting reliable evidence, for example when a field visit is conducted during the case study.
- Physical artefacts: Includes technological devices, tools, instruments, or other physical evidence that may be collected during the study as part of a field visit.

In the present study, several of these sources will be used. For the empirical (primary data) aspect, questionnaires and interviews will provide primary data. A qualitative method will dominate through the use of in-depth face-to-face interviews, using a semi-structured approach in which both open-ended and closed questions will be asked in order to gain the advantages of both structured and unstructured interviews. Additionally, a quantitative approach will feature through the use of a questionnaire containing significant questions relating to the research, the responses/data from which will complement the interview findings. Secondary data regarding the case study and good examples of successful airport organisations will also be gained from different aviation industry documents, whilst secondary data of a theoretical nature will be gathered from academic textbooks, journals, magazines, the Internet and reports. Moreover, the University of Salford provides many important journals that are available through its computer networks.

The data that are collected is mainly dependent on the main research questions and the aims and objectives of the research. It is also dependent on the research philosophy, the research approach and the research strategy (Hussey and Hussey, 1997; Easterby-Smith et al., 2008).

Based on the above, the researcher used both sources of data, both secondary and primary data. Secondary data was collected from books, journal articles and online data to achieve the first objective of this study, to explain the research problem, to support the selection of the research methodology and to support the primary data by collecting organisational documents. Primary data was collected through interviews and direct observation.

5.2 A Questionnaire

A questionnaire is a method of collecting requisite information. It is used for research work by scientists, business entities, postgraduate students etc. A questionnaire contains a list of questions that are framed to obtain facts. It is a form containing a set of questions, particularly addressing a statistically significant number of subjects, as a way of gathering information for a survey.

Surveys*:* Self-reporting surveys can be open-ended or multiple-choice. They can provide a great deal of information in a short time (Jackson, 1990).

5.2.1- Questionnaire Survey as One of Main Data Collection Method Selected for this Study

The questionnaire is a common instrument for collecting information and, as noted by Sharp and Howard (1996), it has grown in use in the twentieth century. Whilst a questionnaire survey approach is especially designed for large populations, it can also be used for smaller samples (Newell, 1993).

As noted by Newell (1993:96), a questionnaire is *"… a set of questions for respondents to complete themselves"*. Hague (1993) noted that the primary purpose of a questionnaire is to draw accurate information from the respondent, and that accurate information is obtained by asking the right question of the right person. This gives a clue to the need for effort in the process of a questionnaire's design. This concentration on data collection echoes the thoughts of Oppenheim (1992) who argued that a questionnaire is not an official form, nor a set of casually-produced questions, but rather an important research instrument designed to collect data and then allow for their measurement. In this respect Simmons (in Gilbert, 2001:86) asserted that *"the success of a survey depends on the questions that are asked, the ways in which they are phrased and the order in which they are placed"*. Clearly then, a questionnaire must be carefully constructed if it is to be effective as a research tool.

5.2.2- Justification of the Data Collection Method (Questionnaire Survey).

Sekaran (1997:200) defines a questionnaire as "a pre-formulated written set of questions to which participants record their answers, usually within largely closely defined alternatives". A similar explanation is provided by deVaus (1996) who suggests that the technique asks each individual in the research sample to answer the same questions in a preLike interviews, questionnaires, provide a way of gathering research data, but their nature is quite different from interviews,

since in a questionnaire, it is the participant who records the information for the researcher to analyse, rather than the researcher who either takes notes in an interview, or works from a transcript of the proceedings and then chooses what to consider or disregard.

The chosen methods of data collection were questionnaire surveys and interviews. The reason more than one type of technique was chosen is because it achieves more accurate results. Also, it has been proven that questionnaire surveys are the most effective form of data collection, as they receive the most responses.

5.2.3- Adopting the Questionnaire Survey

The questionnaire survey was chosen as one of the main data collection tools for this study. This choice was made by the researcher with the help of the supervisor in the light of the aforementioned advantages of utilizing a questionnaire survey generally and also for the following reasons in particular:

5.2.4- Choosing a Sample

The researcher utilised two questionnaires surveys:

1- A survey with airport employees employed at medium levels and low levels of responsibility.
2- A passenger's questionnaire.

1- Questionnaire for employees employed at medium levels and low levels of responsibility within the airports

Two of the biggest airports in Libya were selected for the questionnaire survey data collection: Tripoli airport and Benghazi airport. Within Tripoli airport there are approximately 987 employees (as shown in figure 5-1) of which 35 were selected who were of medium level and low level of responsibility status amongst the employees. Of the 35 employees selected randomly, 25 responded.

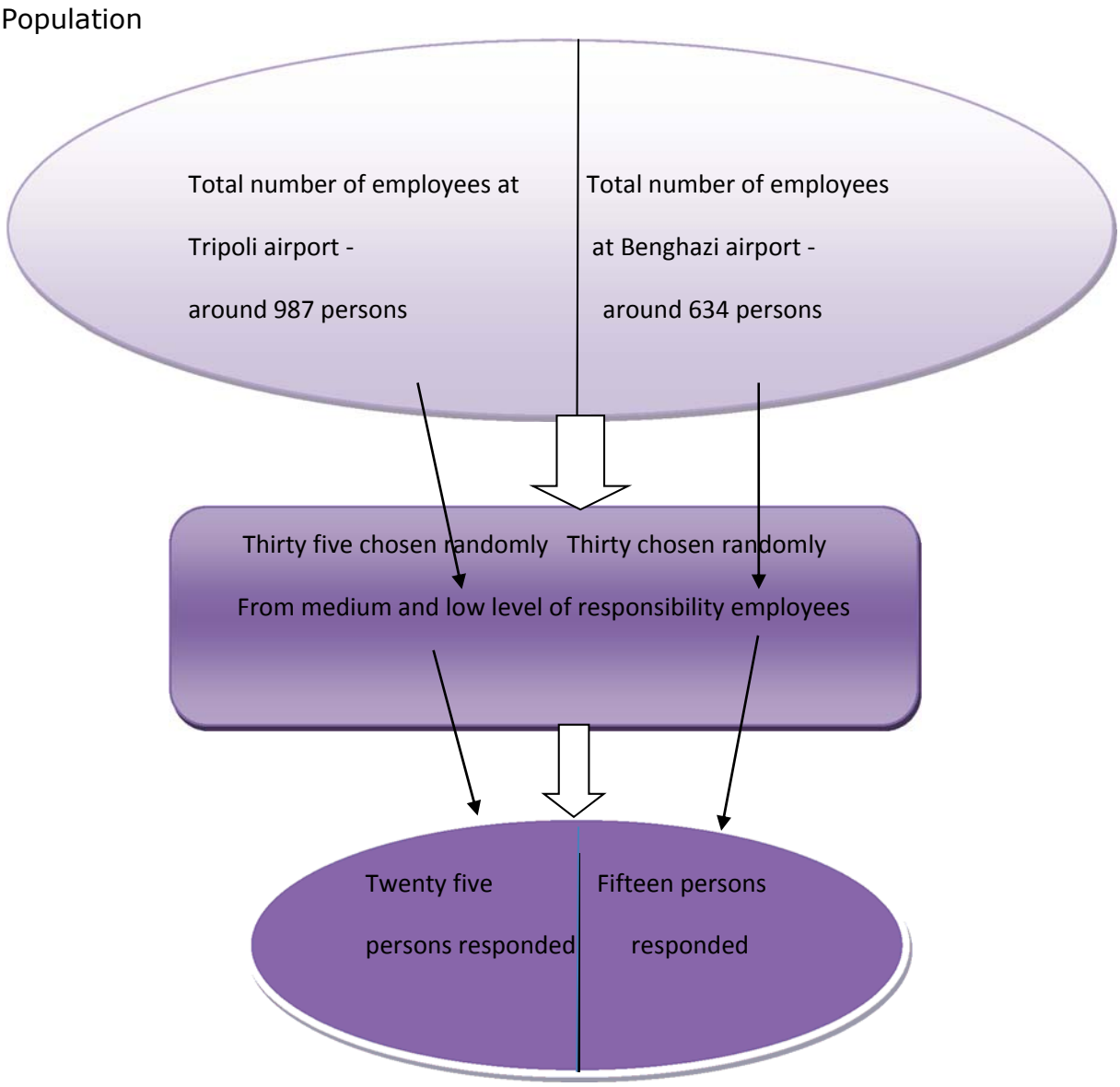

Figure 5-1 The Sample Population

Within Benghazi airport there are approximately 634 employees, of which 30 were asked them randomly to participates in this questionnaire as the researcher asked Tripoli airport participates, again, of medium level and low level of responsibility status. Of these 30 people, 15 responded.

The employees selected for the questionnaire survey were people that the researcher knew personally and thus could be relied upon for a response. It was the best option, picking people who are reliable, who could be counted on to respond to the questionnaire and provide honest and reliable data. Such a choice prevented a waste of time and money. They were also people who can communicate in, and understand, English. The reason behind selecting employees

of medium level and low level status of responsibility is because these are the employees that can be considered as 'average'. They are not the decision makers; they are affected by the decisions of employees of a higher status.

5.2.5 The Questionnaire Survey: Sample and Limitations

The survey sample members were chosen on the basis that they had knowledge about the IT and airport management or because they were responsible for handling environmental information. All the questionnaires (forty of which were completed and even some of them didn't answer all the questions in the questionnaire) were intended to be completed between mid June 2010 and the end of October 2010.

5.2.6 - Conducting the Questionnaire Survey

All the surveys were conducted in a similar way. The questionnaire survey took place without interruption and the participants had sufficient time to develop their arguments and provide useful information. As mentioned earlier, there were forty completed questionnaires with medium level and low level of responsibility status employees. Questionnaires (See appendix 3) were conducted with them within both Libyan airports.

Before each questionnaire was conducted, the selected employees were told the purpose of the research at a confirmation meeting. This helped them in understanding the reason behind the questions asked and made respondents more relaxed and comfortable, allowing them to give more sincere answers. Also, the respondents were allowed to make comments regarding the questions.

2- Passengers' questionnaire

Two of the biggest airports in Libya were selected for the passengers' questionnaire survey data collection: Tripoli airport and Benghazi airport. Within Tripoli airport there were approximately 60 passengers who were randomly selected who were in the airport the day the researcher was there. Of the 60 passengers selected, 29 responded. Within Benghazi airport there were approximately 40 passengers who were randomly selected. Of these 40 people, 11 responded. Thus the questionnaires (see appendix 5) were conducted with passengers across both Libyan airports.

The passengers selected for the questionnaire survey were people that the researcher did not know personally. The researcher did not have option to pick people who are reliable and could be counted on to respond to the questionnaire and provide honest and reliable data. The researcher was there to collect the questionnaire as soon as possible because most of passengers were in a hurry to catch a flight if they are flying, or are going home if they had just arrived. The reason behind selecting passengers to undertaken this questionnaire survey alongside the airports' employees is because these are the people who should be considered. They are not the decision makers but they will be the ones affected if there is better IT implementation within the airports.

5.3 Interviews

An interview is an intentional interaction between persons in which one person seeks information from another person. Interviews can take place face-to-face or by other modes of personal interaction.

Interviews may be used as a tool for data collection and can be undertaken face-to-face, voice-to-voice or screen-to-screen (Collis and Hussey, 2009). Face-to-face interviews can be categorized into three main forms which are unstructured, structured and semi-structured interviews (Easterby-Smith et al., 2008)

Interviews*:* Interview formats can include face-to-face, written questions and answers, or focus groups. Interviews can follow formal protocols or an informal question and answer format. Interviews have the benefit of allowing the researcher to follow up on interesting responses that were not expected. The principal drawback is that a good interview requires much skill and experience, so they are expensive and time-consuming (Jackson, 1990).

5.3.1- Interviews: The Second Main Data Collection Method selected for this Study.

As mentioned above, this study attempts to describe the perceptions of, and the requirements of, IT implementation within the role of employees within corporations, for the purpose of this research with top level IT and non IT managers who have a direct relationship with the airports. These individuals' perspectives were examined by utilising an interview. Separate interview protocols were prepared for all the sets of top level IT managers and non IT managers. The

objectives of the interviews were twofold. First and foremost , an attempt was made to obtain the perceptions and requirements of the top level IT and non IT managers in order to identify the most important issues within Libyan airports.

Thus, for the purpose of this study, interviews with the target groups were used to determine the IT and non IT managers' perceptions of, and requirements for, the airport industry. Moreover, interviews were used to ascertain their opinions on the importance of specific issues of environmental information that are disclosed within the annual report or other media. The selection of utilising interviews rather than a questionnaire for these managers can be justified, since the interview is the most popular method used by the majority of previous studies in terms of investigating individuals. Most typologies used by many authors (Saunders et al., 2012) distinguished three types of interviews in social research. These are the structured interview, the semi-structured interview and unstructured interview. The following are definitions of these interview types:

- Structured interviews - using questionnaires based on a predetermined and standardised or identical set of questions;
- Semi-structured interviews - the researcher will have a list of themes and questions to be covered although these may vary from interview to interview;
- Unstructured interviews - these are used to explore in-depth a general area of interest to the researcher. The basic goal is to put the interviewees at ease and allow them to express themselves.

The evidence in this study was collected using semi-structured, in-depth personal and representative interviews with 12 managers from 2 different Libyan airports in Libya between mid June 2010 and the end of October 2010. One advantage of the semi-structured interview is that is allows flexibility to explore areas as they arise during the interview process. The questions used in the interviews were developed based on previous studies. Open-ended and closed-ended interview questions were asked of the respondents in order to gain insight into the subject considered. Based on these interviews, the factors that can be

attributed to the involvement or non-involvement of IT implementation are ascertained and comparisons with prior studies were undertaken.

5.3.2- Justification of the Data Collection Method (Interviews)

Opdenakker (2006) stated that interviews may consist of face-to-face interviews, telephone interviews, MSN messenger interviews and e-mail interviews. He added that face-to-face interviews are the most common and telephone interviews are also popular. The differences in the advantages and disadvantages of the four interview techniques relate to their differences in the dimensions of synchronous communication in time and/or space and asynchronous communication in time and/or space. Table 5-1 presents the four interview techniques relating to these dimensions.

Opdenakker (2006) identified the advantages and some contingent disadvantages of the face-to-face interviews technique which are:

- Face-to-face interviews are characterised by synchronous communication in time and place, which no other interview method can claim as its advantage;
- Using face-to-face interviews means there is no significant time delay between question and answer. In other words, the interviewer and interviewee can directly react to what the other says or does;
- The answer of the interviewee is more spontaneous, without extended reflection;
- Face-to-face interviews can be recorded, of course only with the permission of the interviewee. Using a recorder has the advantage that the report of the interview is more accurate than writing out notes.
- The interviewer has many possibilities to create a good interview ambience. In other words, the interviewer can make more use of a standardisation of the situation. On the other hand, this synchronous communication of time and place can take a great deal of time and costs.
- The termination of a face-to-face interview is easy, compared to other interview methods. In the interaction between interviewer and interviewee enough clues can be given that the end of the interview is near.

	Time:	**Place:**
Synchronous communication	Face-to-face MSN messenger Telephone	Face-to-face
Asynchronous communication	E-mail	E-mail MSN messenger Telephon.

Table 5-1: The four interview techniques divided by synchronous/asynchronous communication in time and/or space (Adapted from Opdenakker, 2006)

As seen in table 5-1 above, face to face interviews are characterised by synchronous communication in time and place and e-mail interviews are characterised as asynchronous communication in time and place. MSN messenger and telephone interviews are characterised by synchronous communication in time, but asynchronous communication in place. The advantages and disadvantages of the four interview techniques relate to the technology used. In this study, the face-to-face interview technique was used to collect data from ten persons because it has more advantages than any of the other techniques above. For the other two persons, the researcher used the telephone to collect the data because it was difficult to get in touch with them when the researcher was in Benghazi (three persons interviewed face to face and the other two persons by telephone) because the researcher couldn't stay any longer and the situation getting rough in Benghazi and the researcher from Tripoli it was difficult to go back more than 1,000 Kilometres to collect data again and it was also difficult because of the situation in Libya leading up to the revolutionary war.

5.3.3- Adopting Semi-structured Interviews

The face-to-face semi-structured interview was chosen as second main data collection tool for this study. This choice was made by the researcher with help

from the supervisor in the light of the aforementioned advantages of interviews generally and for the following reasons in particular:

- It has the capacity to provide important insights into a phenomenon under study through the eyes of interviewees and well-informed respondents (Yin, 2009);
- Interviewees are able to provide additional explanations where they believe it is necessary (Deegan and Blomquist, 2006).

For these reasons it was decided that the semi-structured interview should be chosen as the second of the main methods for this study.

5.4 The Field Study

5.4.1 Setting Interview Questions

Interview questions were carefully prepared to cover the key areas in this research in order to collect the credible data needed. The questions were mainly open-ended, broad and indirect questions. They were designed to collect rich, deep and comprehensive information about the factors that affect the adoption of Libyan aviation industry in general and Libyan airports in particular. Consequently, the research aim and questions also the list of the adoption factors of IT Implementation were used as guidance and looked at several times in order to generate the initial draft of the interview questions (See Appendix 1).

5.4.2 Pilot Case Study

The questions asked by researchers, either through interviews or questionnaires should be tested by a pilot study according to methodology research experts (Yin, 2009; Sekaran 2009). Brenner et al. (1985) stated that a pilot study is carried out to assess the validity and credibility of the interview questions and procedures. Also Yin (2009) and Collis & Hussey (2009) recommended testing interview questions by conducting a pilot study on people who are similar to those in the real case study, in order to refine the interview instrument and to improve the data collection procedures.

In this research, the researcher conducted two pilot studies to test and to check whether the questions were understandable to the interviewees and that they were comprehensive enough to cover the research problem. They were also

used to ensure that there was no ambiguity in the questions and to estimate the interviews' duration for the real case study appointments. After the initial draft of the interview questions was discussed with the supervisor and feedback taken into account, the first pilot study was conducted in UK with three PhD students who work on related subjects. In each pilot study the researcher took a copy of the research questions, aim, objectives and some background information on IT implementation in Libyan airports and on the factors affecting its adoption. The researcher then sat with each interviewee and discussed the draft and the processes of collecting the data. Next the researcher made some changes to the draft based on the comments that were received in the pilot study. This step is supported by Ghauri and Gronhaug (2005) who argued that it is very useful to let somebody else see the problem statement and the questions to be asked in the interviews in order to look for any similarities. The second pilot study was conducted with five employees from different managerial levels in Tripoli airport, three from the airport IT management, one from communication airport middle management and one from Libyan Airlines IT management in the airport. The same procedure was followed as in the first pilot study. The researcher made some changes in the questions (such as language adjustments, re-phrasing and re-arrangement) in order to make them understandable and clear.

5.4.3 The Interview Sample and Limitations.

For the interviewing stage of this data collection, altogether 12 employees were selected; seven from Tripoli airport and five from Benghazi airport. For this, people of a higher status, employment-wise, were selected. Those selected were employees who were high up in the organisations and who made decisions that affected the running of the airports, for example, decision makers, IT managers, managers and top level employees. These top managers were chosen because they had a direct relationship with the airports.

The researcher chose seven people from Tripoli airport:

- IT Department Manager.
- Financial Department Manager.
- IT Section Chief.

- IT Department Manager.
- IT Assistant Manager.
- The Supervisor of the Technical Information Section.
- The IT group leader.

The researcher chose another five people from Benghazi airport:

- IT Department Manager.
- Assistant Manager.
- ICT Deputy Manager
- IT Head Of Staff
- IT Assistant Manager

The population targeted for the interviews were those who were thought to possess familiarity with the running of an airport and who could influence the Libyan organisations directly. The particular interviewees were chosen on the basis that they had knowledge about IT and airport management or because they were responsible for handling environmental information. All 12 interviews were intended to be completed between mid June 2010 and the end of October 2010. The reason being there was limited time and resources for data transcription whilst in Libya. All 12 interviews were recorded with the permission of the interviewees. Notes were also taken during all interviews and later the notes were confirmed by the interviewees.

In formulating appropriate questions for the interviews, the guidelines given by Tellis, (1997) and by Saunders et al. (2012) were considered in detail. They recommended that three types of questions can be used in semi-structured interviews:

- Open questions that help to define and describe a situation or event;
- Probing questions that can be used to explore responses that are of significance to the research topic;

- Specific and closed questions that may be used to obtain specific information or to confirm a fact or opinion.

The original interview questions were drafted in English (see Appendix 1). The semi-structured interview questions were designed to cover the seven categories of content in order to achieve the research aim and objectives successfully. Open-ended and closed-ended questions were used to develop the research instrument. By using this type of semi-structured interview questions the respondents were asked to comment about the subject investigated and to provide insights into the subject.

To enhance validity and reliability, the researcher's supervisor, who has relevant expertise, reviewed the questions. His comments were taken into consideration.

5.4.4 Conducting the Interviews

As discussed earlier, the information was collected by conducting face-to-face semi-structured interviews. The interviews were conducted in Libya during the period between mid June 2010 and the end of October 2010. All the interviews were conducted in a similar way. The interviews were undertaken without interruption and the interviewees had sufficient time to develop their arguments and provide useful information.

As mentioned earlier, there were 12 interviews with IT and non IT managers (decision makers, IT managers, managers and top level employees). Interviews were conducted with them as they were top level airport people. Seven people who were interviewed were from Tripoli airport, and five were from Benghazi Airport.

The interviews involved two steps. The first step was contacting and making appointments with the interviewees in a suitable interviewing environment (time and the place of interviews were according to interviewee's preference and could in their offices or elsewhere). The second step was the interviewing process. Before each interview, the interviewee was given a description of the research purpose at a confirmation meeting. This helped in the understanding of the questions, made respondents more relaxed and comfortable so that they could

give more sincere answers. Respondents were allowed to make comments regarding the questions before the interviews were conducted.

Typically, the data collecting process began with general questions such as the profession of, and the degree held by, the interviewees and the name of their organization. The interview guideline (see Appendix 1) was used as a guideline for the researcher during the interviews. All the interviewees signed the consent form questions allowing the use of the collected data in this thesis and for publication in different academic forums. A promise of anonymity was given to all interviewees. After each interview, the researcher thanked the respondents. All interviews were transcribed immediately afterwards.

5.4.5 Number of Interviews

There are no rules governing identifying what is regarded as a sufficient number of interviews in qualitative research in recent literature. The choice of the number of interviews is based on the purpose of the study or on the available time and resources. On other hand, the literature has identified that the size of sampling in quantitative research should be based on the size of the research population, while in qualitative research the number of interviews must be identified based on 'replication logic' rather than on 'sampling logic'.

Therefore, experienced methodologists recommend that the qualitative researcher should keep on interviewing participants until the researcher reaches `replication' (that is, collecting repetitive data and hearing the same stories repeated again and again) or "saturation point" wherein no new information emerges during the interview process (Saunders et al., 2012; Yin, 2009; Easterby-Smith et al., 2008; Creswell, 2009).

5.5 Translation into Arabic Language

The questionnaire and the interview protocol was developed in the English language and, because the official language in Libya is Arabic,and because some of the participants in the questionnaire and the interviews of the questions were translated into the Arabic language by the researcher and a PhD specialist who has graduated from UK. They were checked by another Libyan who is a proficient English language speaker. some of the questionnaire and the interviews were conducted in Arabic and, for the purposes of analysis and in order to minimise any

misunderstandings arising from inaccurate translation. Some of the respondents asked the questions and replied in their mother tongue. This enabled them to optimise the verbalisation of their responses, after that the Arabic version of the questionnaire and the interviews were translated in English.

5.6 Chapter Summary

The relevant literature pertaining to the area has been reviewed and the data collection focusing on the IT implementation has been conducted. Next, the data undergoes the analyses' process. The data that has been collected can be divided into two groups:

- The first group consisted of the responses of the forty questionnaire surveys completed by personnel from the middle level and low level of responsibility from within the two biggest airports in Libya
- The second group were the responses collected via forty questionnaire surveys completed by passengers in both airports.

Interview data was collected via semi-structured face-to-face interviews with twelve personnel from the top level of managers within the two Libyan airports, seven persons from Tripoli airport and five persons from Benghazi airport.

Chapter 6

Data Analysis.

6. Data Analysis.

Data analysis comprises examining, categorising, tabulating and interpreting the evidence to support, reject or amend a theory and/or to generate new theory. However, there is no standardised approach to the analysis of qualitative data (Saunders et al., 2012).

In order to deconstruct the data, explore the underlying meanings and to generate theory, Miles and Huberman, (1994) proposed the following stages for qualitative data analysis:

- Data reduction: Data reduction is the process of selecting, focusing, simplifying, abstracting and transforming the data obtained in order to focus on emergent constructs;
- Data display: Data display is the organisation of the compressed data, thus assembling the information from which conclusions may be drawn. The organisation and compression of the data is considered a means of making visible the themes that run through the data;
- Conclusion drawing and verification: These involve the researcher's interpretation of the data, extracting meaning out of the data displayed, identifying patterns and themes and using strategy to develop theory.

Kumar, (2005) illustrated the steps in data processing qualitative and quantitative data. The process of analysis of qualitative data involves a number of steps (Kumar, 2005, p. 240, 241):

- Step 1: Identifying the main themes;
- Step 2: Assigning codes to the main theme;
- Step3: Classifying responses under the main themes. This thematic analysis can be undertaken manually or using a computer programme such as NVivo but the researcher using Matrices.
- Step 4: Integrating themes and responses into the text of the report.

6.1 Quantitative Analyses with the SPSS Tool used for Questionnaire Surveys

In order to analyse the quantitative data, statistical techniques (such as those embraced within the SPSS software) will be used as appropriate, thereby providing data that complements the major data collection process.

Each person undertaking the questionnaire survey signed a consent form (see Appendix 5 showing the Ethical Approval request form utilised for using the collected data in this thesis and for the publication of this data in different academic forms. A promise of anonymity was given to all respondents. Following

the collection of data from the people within the survey, they were thanked by the researcher.

The researcher utilised two questionnaires:

1- The questionnaire for the employees at medium level and low level of responsibility within the airports.
2- Questionnaire for the passengers.

1- Questionnaire for the employees within the airports at medium level and low level of responsibility (see section 5.2.4 and Figure 5-1).

Question 1 enquired about the position of the respondents on continental basis as top level IT leader of the Airport? The responses are captured in the table 6-1 and the percentage is given in figure 6-1.

Question 1: Are you officially designated as the top IT leader of the airport?

Question 1	
Yes	No
8	31

Table 6-1: Top IT leader of the airport

As shown in table 6-1 the total numbers are 39 that's because some questionnaires' didn't answer all questions which were 40 question.

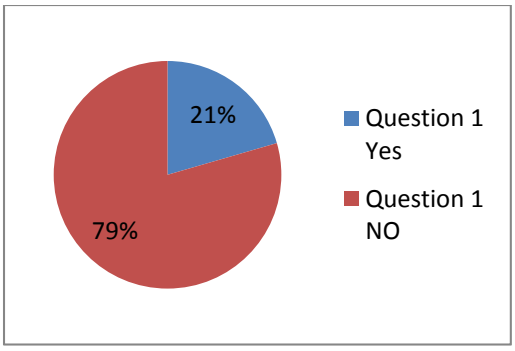

Figure 6-1: Top IT leader of the airport

As shown in figure 6-1 and table 6-1 the majority of the respondent (31 persons/79 percent) answered no and 8 (or 21 percent) said yes. Significantly, the implications of the background survey of the respondents suggest the impact the study has shown the majority consider them self they are the decision makers in their field and this study has affected their views of themselves.

Question 2. To which position(s) does the top IT leader in the airport report?

Tick all that apply.

Question 2									
Secretary of the P.C of the Airport	Vice Secretary Airport	Chief administrative officer	Executive Director of IT	Director of IT	Director of IT Planning	Chief financial officer	Executive VP/COO	General Director	Other
20	2	22	22	8	12	8	0	8	0

Table 6-2: Airport report

Questions 2 sought information about the position(s) of the top IT leader in the airport. As shown in figure 6-2 and table 6-2, most of IT leader they report to the two of the decision makers to the executive director of IT 22 percent or/and to the secretary of the PC of the airport 20 percent or/and 8 percent to the IT director searing that with chief financial officer and general director

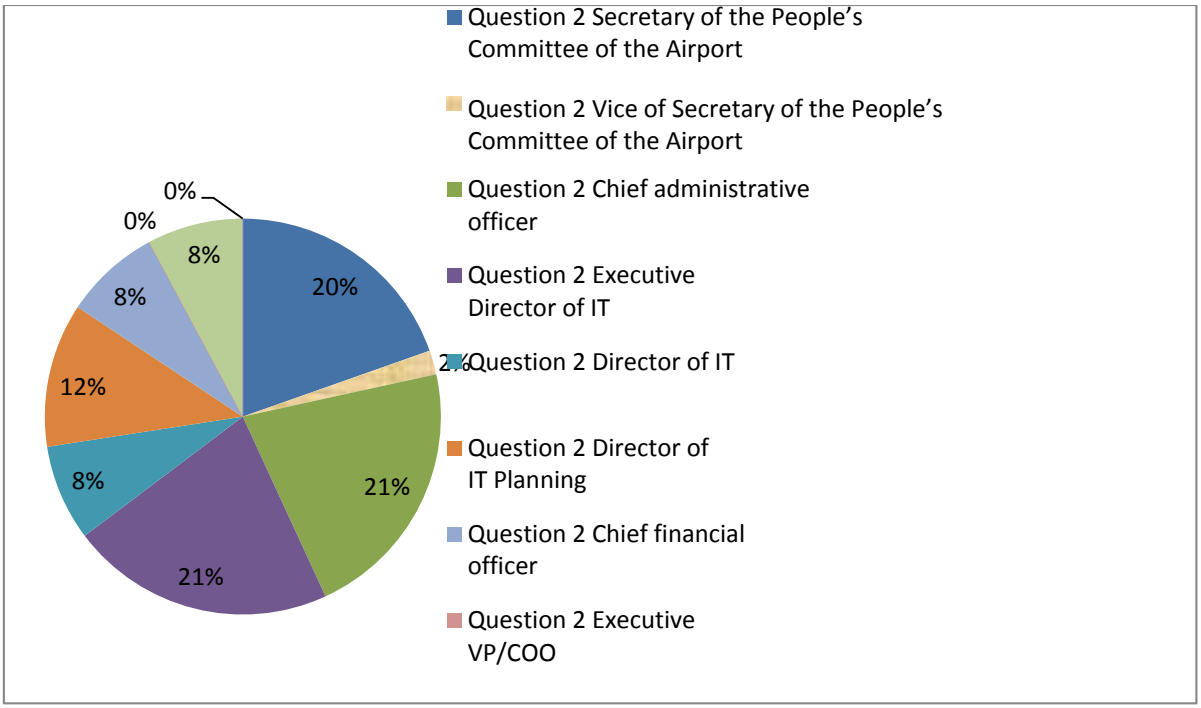

Figure 6-2: Airport report

3. How do you find the IT system in the airport?

Question 3			
Poor	Good	Very Good	Excellent
34	5	0	0

Table 6-3: How good the IT system is in the airports

Question 3 indicates how the participants found the IT system in the airports. According to figure 6-3 and table 6-3, thirty-four of the respondents (or 87%) found the system to be of a poor standard. Only five people (or 13%) found the system to be of a good standard. None of the participants thought the system was very good or excellent.

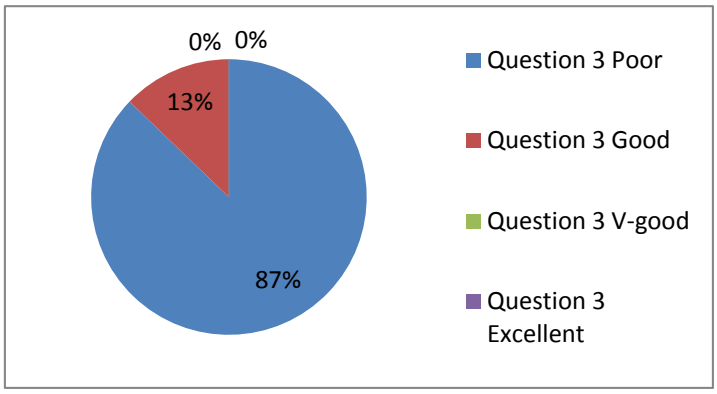

Figure 6 -3: How good the IT system is in the airports

4. What is/are the size of IT system in the Airport?

Question 4			
Very large	Large	Medium	Small
0	0	0	40

Table 6-4: The size of IT system in the Airport

In figure 6-4 and table 6-4 we see how all the respondents thought the size of the IT system was small. All the respondents agreed the IT system did not have sufficient capacity.

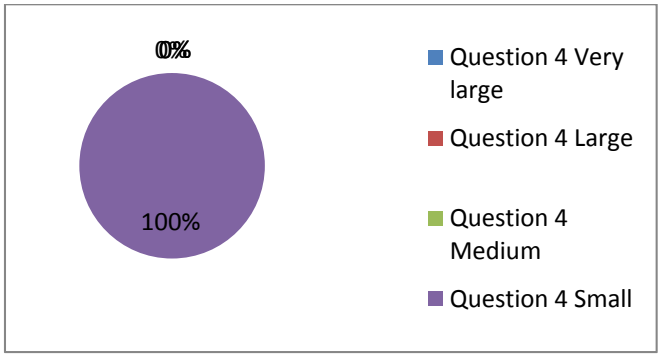

Figure 6- 4: The size of IT system in the Airport.

5. Which statement best characterizes your institution's current attitude toward IT Strategy Implementation?

Question 5		
Statement 1	Statement 2	Statement 3
0	0	40

Table 6-5: The best current attitude toward IT Strategy Implementation.

Question 5 enquired which descriptive statement best fitted the institution's attitude towards IT strategy implementation. As shown in figure 6-5 and table 6-5, all 40 of the respondents (or 100%) chose statement 3 to best describe their institution's attitude towards IT strategy implementation.

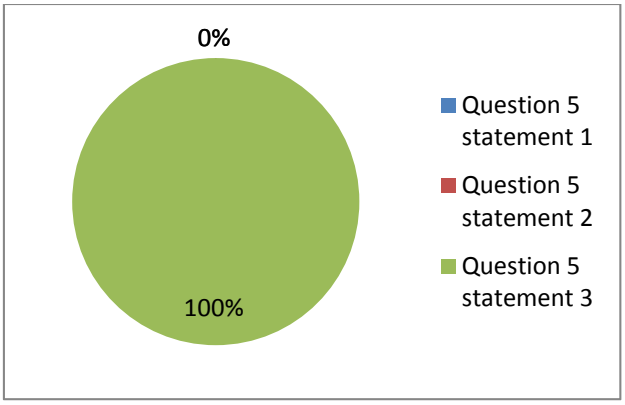

Figure 6- 5: The best current attitude toward IT Strategy Implementation

6- Which statement best characterizes the organizational climate of the Airport?

Question 6		
Stable	Dynamic	Volatile
27	0	6

Table 6- 6: The best statement characterizes the organizational climate of the Airport.

Question 6 found out how the respondents characterised the organisational climate in the airport. As shown in figure 6 and table 6, 27 participants or 82% described it as a stable climate. Only 18% or 6 respondents would characterise the climate as volatile.

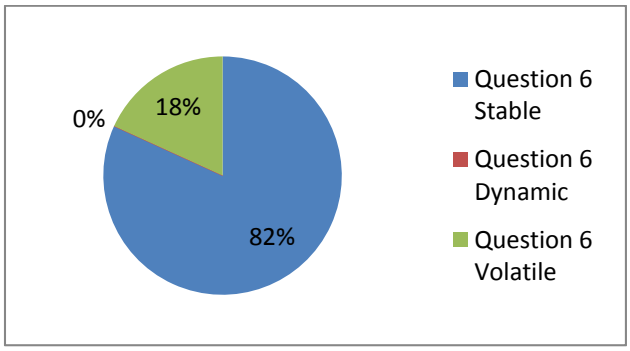

Figure 6- 6: The best statement characterizes the organizational climate of the Airport.

7. When did your institution complete its most recent IT strategic implementation effort?

Question 7			
2009	2010	2011	Prior to
0	39	0	0

Table 6-7: The most recent IT strategic implementation effort completed.

Question 7 enquired as to when the participant's institution completed an IT strategic implementation. Figure 6-7 and table 6-7 shows the results: 100% or 39 of the respondents saying it was undertaken as recently as 2010.

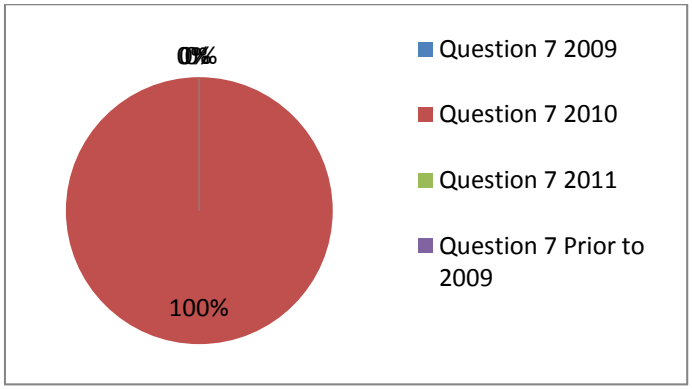

Figure 6-7: The most recent IT strategic implementation effort completed.

8. How does the IT department at the airport communicate its PRIORITIES and PERFORMANCE? Tick the top three approaches.

Question 8								
Focus groups	Regularly	Performance	Videos	Annual	balanced scorecard	Newsletters	Press	Other
0	8	8	0	29	8	0	0	0

Table 6- 8: Airport IT department communicate (PRIORITIES and PERFORMANCE)

The answers to Question 8 showed how the airport's IT department convey their priorities and performance. Over half of the respondents (29 people (55%)) reported that their departments conduct them annually. The other 45% was

divided between performance dashboards and balanced scorecards. 15% received regular updates.

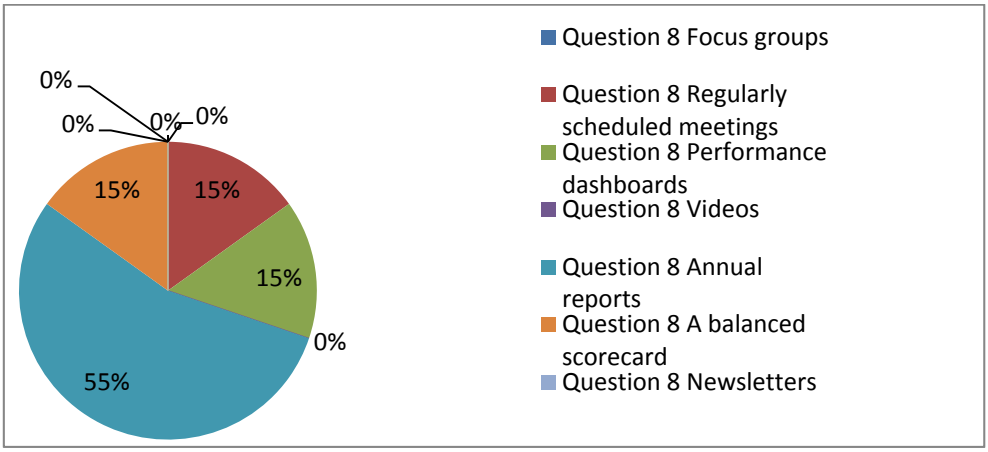

Figure 6- 8: Airport IT department communicate (PRIORITIES and PERFORMANCE)

9- How frequently does your IT organization report on the progress of goals that are stated in IT plans?

Question 9						
Monthly	Every two months	Quarterly	Semi-annually	Annually	Never	Other
0	0	0	0	38	0	0

Table 6-9: IT organization report on the progress of goals that are stated in IT plans.

The answerers Question 9 showed how frequently the respondents receive reports on the progress towards any goals set out in the IT plans. 38 of the respondents (100% because only 38 respond for this question) received progress reports annually.

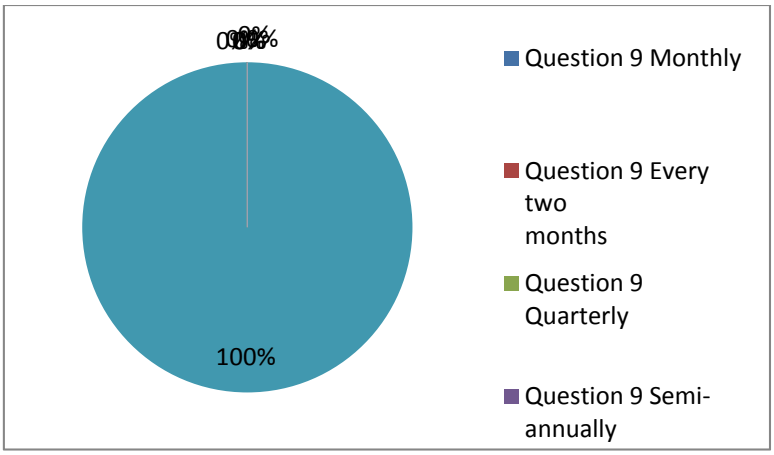

Figure 6-9: IT organization report on the progress of goals that are stated in IT plans

10. Why is IT measured? Please tick the top three reasons [3 responses].

Question 10								
Reason 1	Reason 2	Reason 3	Reason 4	Reason 5	Reason 6	Reason 7	Reason 8	Reason 9
18	6	0	24	7	0	20	0	10

Table 6-10: The reasons of measuring IT

Answers to Question 10 showed the results from the respondents in answer to the question as to why IT is measured. Figure 6-10 and table 10 show that reason 4 was the most commonly cited reason. 24 participants (or 28%) chose reason 4. Reason 1 and reason 7 were the second and third most chosen with 21% and 24% respectively.

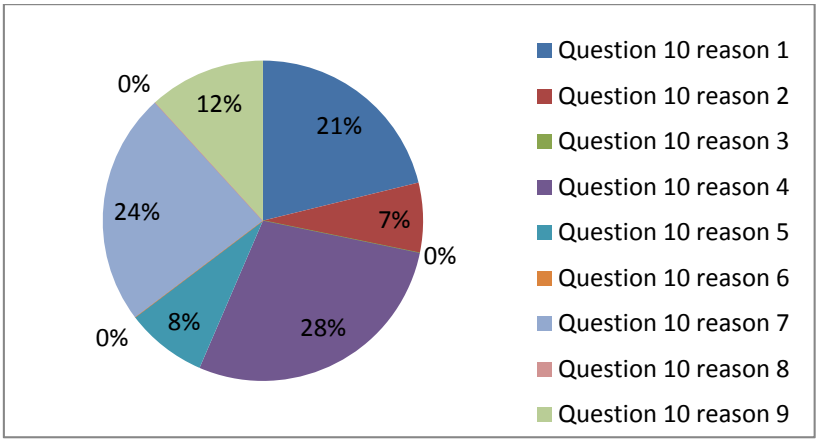

Figure 6-10: The reasons of measuring IT

The second part of the questionnaire comprised a series of statements as shown in the section below.

Evaluating the achievement of IT priorities and using measurement to inform IT priority-setting.

Please state your opinion on the following statements.

1. There is a shortage of manpower (skilled, semi-skilled, unskilled labour)

Statement 1							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
0	14	22	4	0	0	25	17

Table 6-11: The shortage of manpower

Table 6-11 and figure 6-11 show that the all respondents agreed that there is a shortage of manpower.

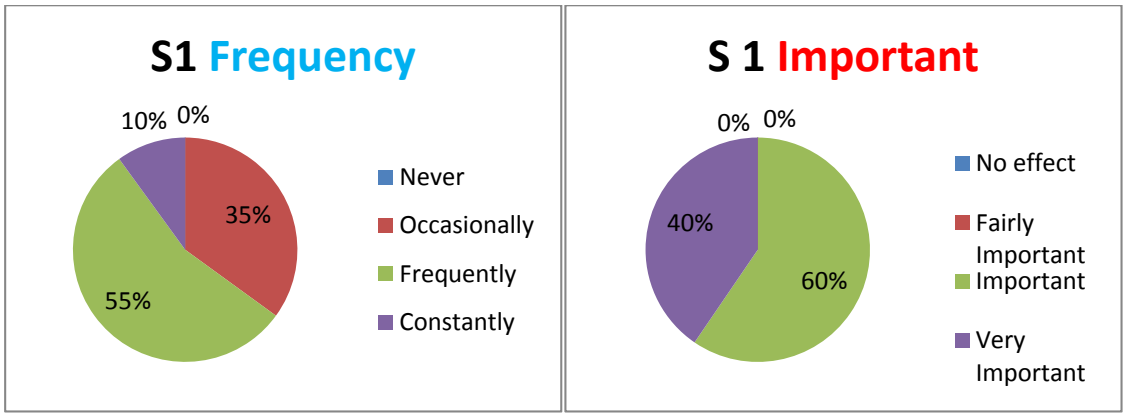

Figure 6-11: The shortage of manpower

The questionnaire included closed questions and the data gathered was predominantly quantitative. The questionnaire contained 78 closed questions/statements starting with 22 questions than 58 statements. The first statement of the 58 asked concerning the shortage of manpower in the organization. Responding to the frequency statement 55% said frequently, 35% said occasionally and 10% said constantly. On other hand, in the importance rankings 60% said it was important to consider manpower and 40% said it was

very important to consider manpower. The results provided comparatives between the aspects such as IT skills and maturity.

2. Implementation of IT initiatives is guided by a formal, institutional priority-setting process.

Statement 2							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
2	23	14	0	0	14	20	5

Table 6-12: Implementation of IT initiatives

Figure 6-12 presents the responses to the statement: the implementation of IT initiatives is guided by a formal, institutional priority-setting process. The table (Table 6-12) portrays the frequency and importance aspects as given by the respondents' answers. As shown, 51% of the participants thought this issue was important.

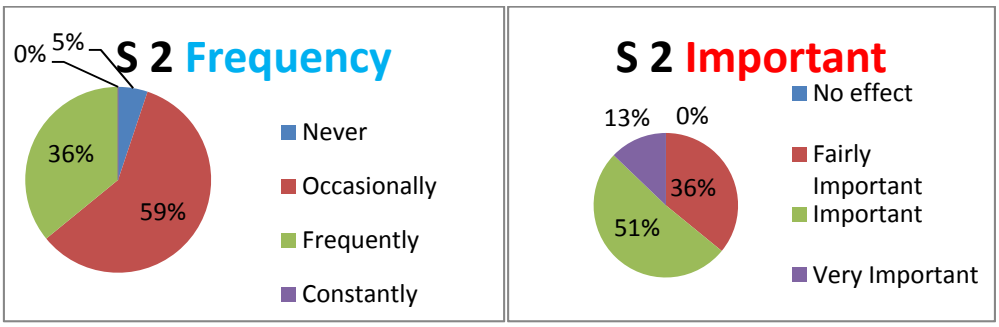

Figure 6-12: Implementation of IT initiatives

3. An IT implementation framework includes resource requirements.

Statement 3							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
18	11	8	0	16	13	8	2

Table 6-13: The requirements IT implementation framework

Figure 6-13 shows that an IT implementation framework includes resource requirements. It portrays the frequency and importance of this as rated by the participants' answers. 41% of the respondents felt that framework did not require resource requirements.

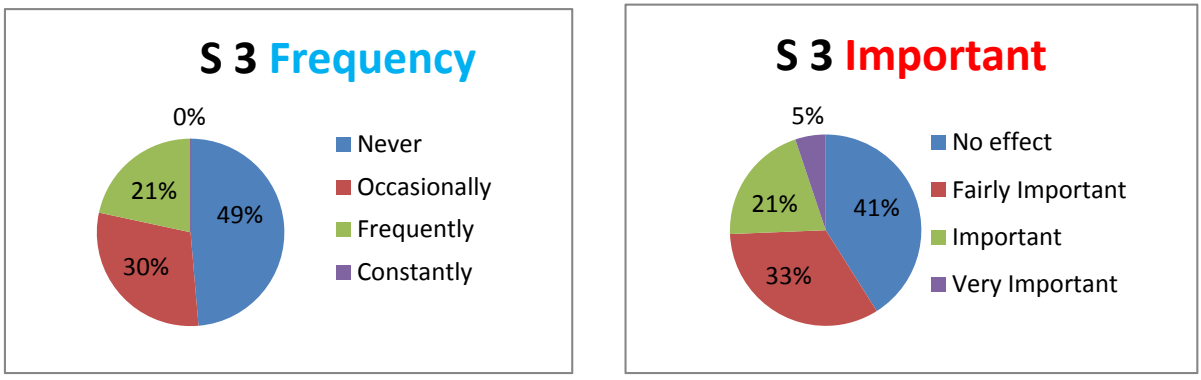

Figure 6-13: The requirements IT implementation framework

4. An IT implementation framework specifies metrics (measures) for evaluating outcomes.

Statement 4							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
27	13	0	0	0	11	23	3

Table 6-14: Evaluating outcomes of IT implementation framework specifies metric

In figure 6-14 show the IT implementation framework specifies metrics (measures) for evaluating outcomes for both the frequency and the important in percentages.

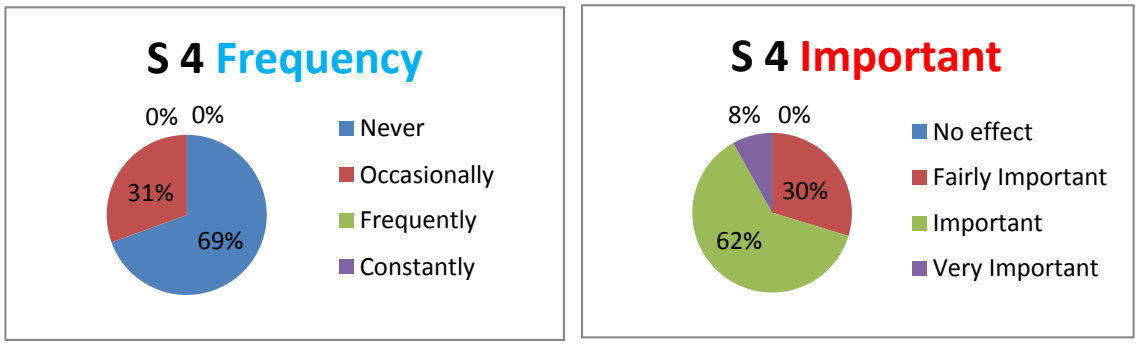

Figure 6-14: Evaluating outcomes of IT implementation framework specifies metrics

The above table shows that it is 'fairly less than occasional' that an IT implementation framework is used for evaluating outcomes. However, it is very important to make use of framework metrics for evaluating purposes as shown by the response from the participants. 23 people (62%) of the participants agreed that it is important to use metrics.

Figure 6-14 shows (in percentages) the outcomes for the respondents' evaluation of the frequency and importance of an IT implementation framework specifying metrics (measures) for evaluating.

5. The Airport publishes performance expectations for network reliability.

Statement 5							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
8	27	4	0	0	0	26	13

Table 6-15: Network reliability publishes performance expectations of the airport

It is very important to publish performance expectation for network reliability as agreed by 13 participants (33%) agreed that it is very important to publish performance expectation for network reliability and 67% said it is

important to publish the details 27 participants (69%) stated that very occasionally reports are published.

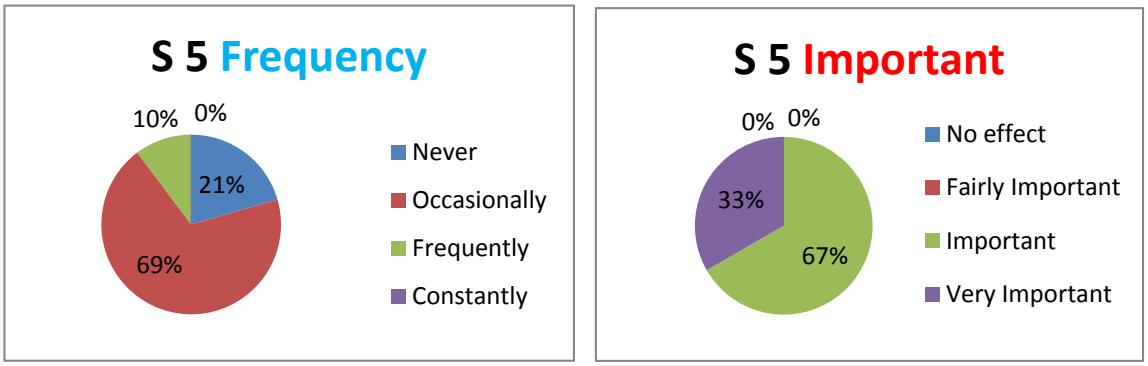

Figure 6-15: Network reliability publishes performance expectations of the airport

6. The Airport publishes performance expectations for other IT services.

Statement 6							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
19	19	0	2	0	0	26	13

Table 6-16: Performance expectations for the airport in other IT services.

26 participants agreed that is important to publish performance expectations for other IT services and 13 thought it was very important to publish the details whereas almost equivalent number of participants said that they are never published or occasionally published.

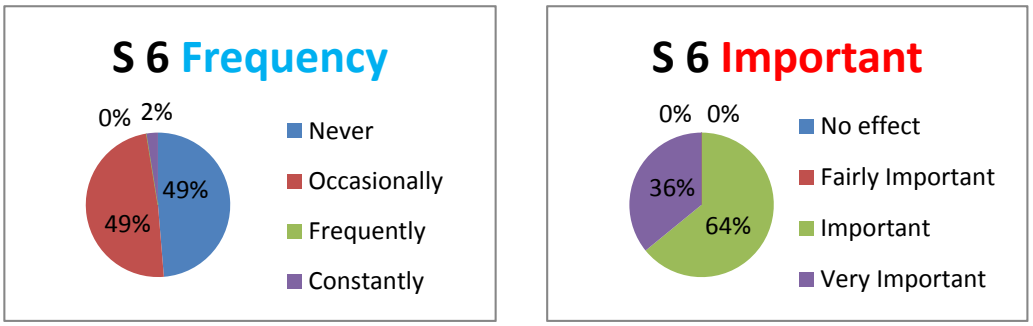

Figure 6-16: Performance expectations of the airport in other IT services.

7. The Airport's IT priorities are well understood. Here the researcher only used the important statement without using the frequency scale, because this question goes with important statement only.

Statement 7							
Frequency				Important			
				No effect	Fairly Important	Important	Very Important
				0	9	25	5

Table 6-17: The understood of IT priorities in the airport.

It was found that many participants, 25 which is 64% of the total said it is important to understand the priorities of Airport IT.

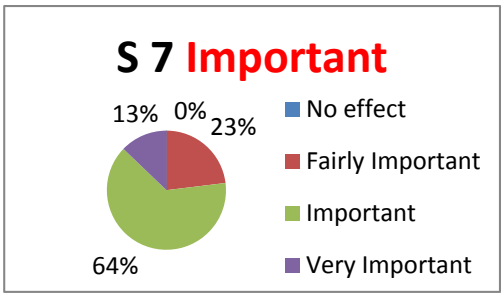

Figure: 6-17 the understood of IT priorities in the airport.

8. Lack of motivation among airport staff members who use IT?

Statement 8							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
4	16	17	0	2	9	21	7

Table 6-18: The lack of motivation among IT's members.

It can be seen in table 6-18, that the participants stated 'more frequent' and 'occasional' to see a lack of motivation amongst the IT airport staff members. It was also said by the participants that it was important to have

motivation amongst the IT airport staff members. (54% confirmed that it was important).

Lack of motivation among airport staff members who use IT?

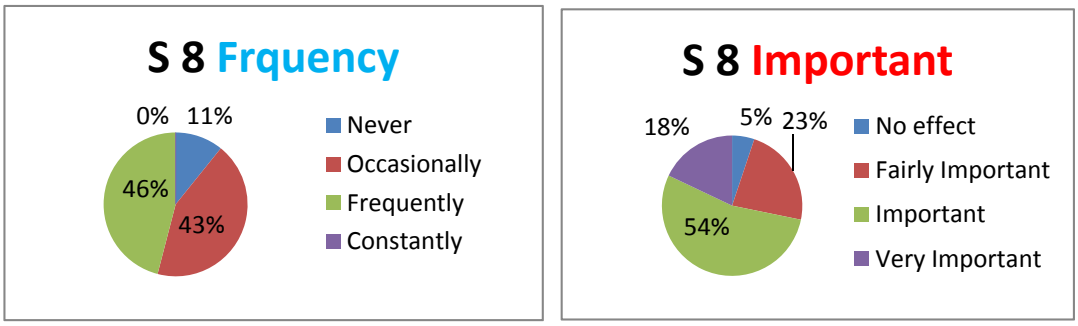

Figure 6-18: The lack of motivation among IT's members.

9. Shortage of technical professionals in the organization.

Statement 9							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
37	3	0	0	0	20	17	0

Table6-19: Shortage of technical professionals in the organization.

Participants reported that there were no technical professionals in the organization. They also confirmed that it was fairly important to have technical experts and professionals in the organization. 17 participants (54%) said it was important to have technical professionals.

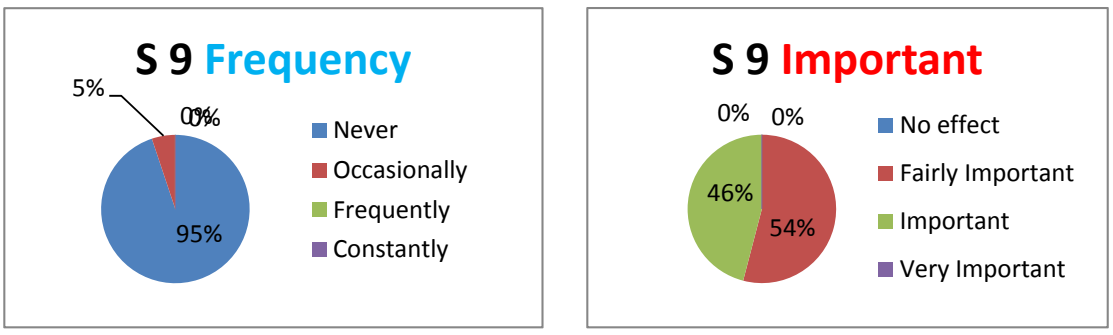

Figure 6-19: Shortage of technical professionals in the organization.

10. Poor communications by the department with the parties involved in the project.

Statement 10							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
33	6	0	0	21	0	18	0

Table 6-20: Poor communications by the department.

Participants reported that there was almost no communication by the parties involved in the project (as 21 participants said there was no effective communication between the parties that are involved in the project). 18% of the participants considered it to be important to have communication between the parties involved in the project.

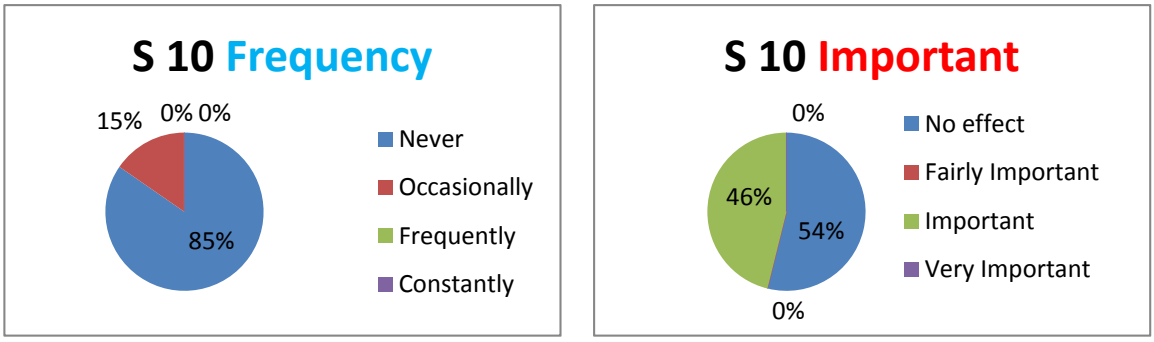

Figure 6-20: Poor communications by the department.

11. How could the potential of IT be realised to improve business performance in the airport.

Statement 11							
Frequency				Important			
				No effect	Fairly Important	Important	Very Important
				0	9	27	3

Table 6-21: IT be realised to improve business performance in the Airport.

The statement 'the potential of IT can be realized to improve business performance in the airport' was considered important by 27 participants, see table 6-21 whereas 23% of the total thought it was fairly important.

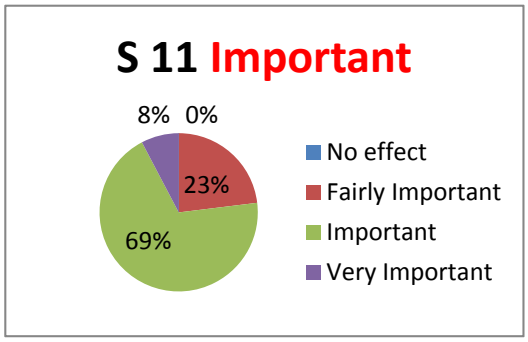

Figure 6-21: IT be realised to improve business performance in the Airport.

12. Inefficient quality control by the department.

Statment 12							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
0	39	0	0	2	21	19	0

Table 6-22: Inefficient quality control by the department.

As shown in table 6-22, 39 participants reported that it was 'very occasional' to see quality control by the department (whereas it was considered fairly important to have quality control) and, as seen in figure 6-20, 45% of the total said it was important.

12. Inefficient quality control by the department.

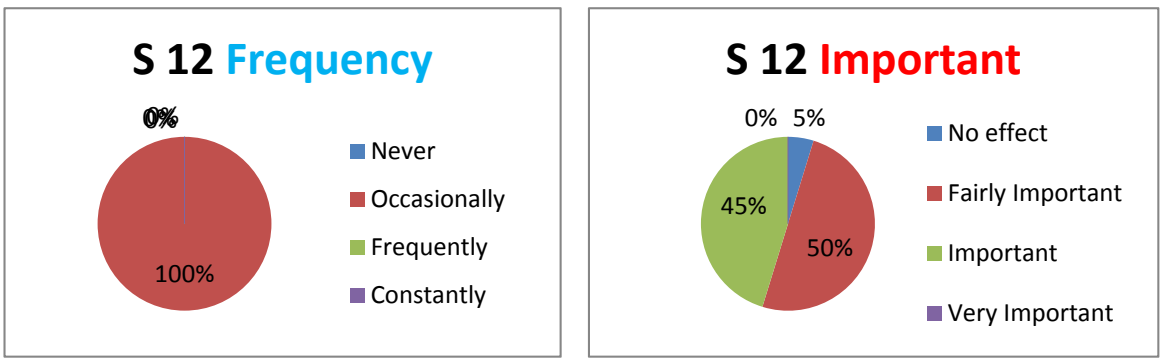

Figure 6-22: Inefficient quality control by the department

Statment 13							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
0	29	10	0	0	11	13	15

Table 6-23: The respond of IT management.

29 Participants as show in table 6-23 said it was occasional to see IT management respond and it was considered important by 13 participants for IT Management to respond, 15 participants who are 39% of the total called it very important.

13. IT management responds.

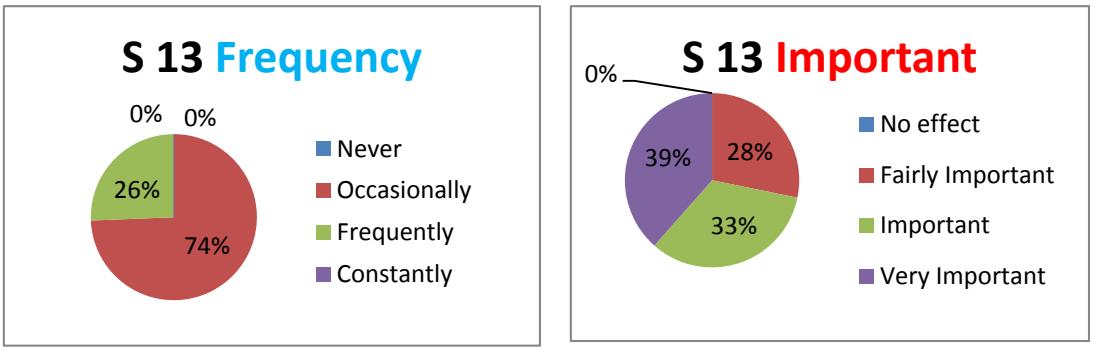

Figure 6-23: The respond of IT management.

14. Senior leaders at the airport regularly consider the IT implications of institutional decisions.

Statement 14							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
22	5	12	0	2	23	15	0

Table 6-24: IT implications of institutional decisions.

It was found that 69% of the officers never considered IT implementation recently where it was considered fairly important by 23 participants and important by 15 Participants to implement IT in institutional decisions

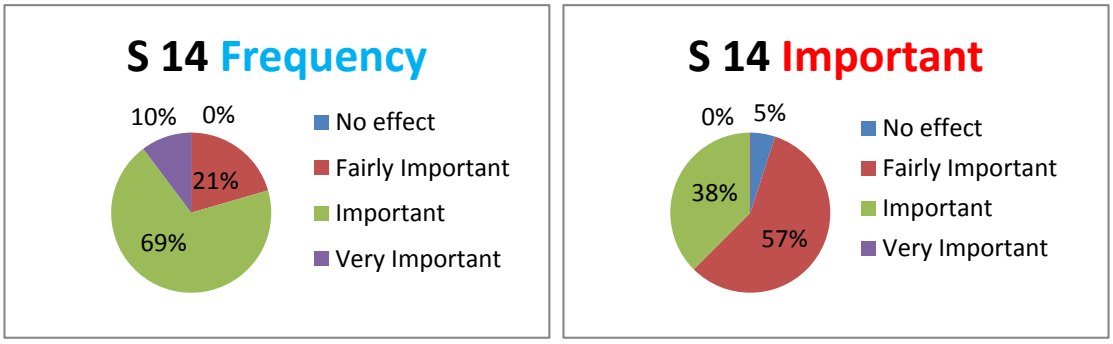

Figure 6-24: IT implications of institutional decisions.

Materials & Equipment

15. Shortage of required equipment.

Statement 15							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
24	15	0	0	0	20	20	0

Table 6-25: The shortage of required equipment.

It was never due to shortage of equipment according to 24 participants, table 6-25 and in figure12-15, which are 62% of the total participants, it was considered important by 20 participants and the other 50% of the participants considered fairly important.

15. Shortage of required equipment.

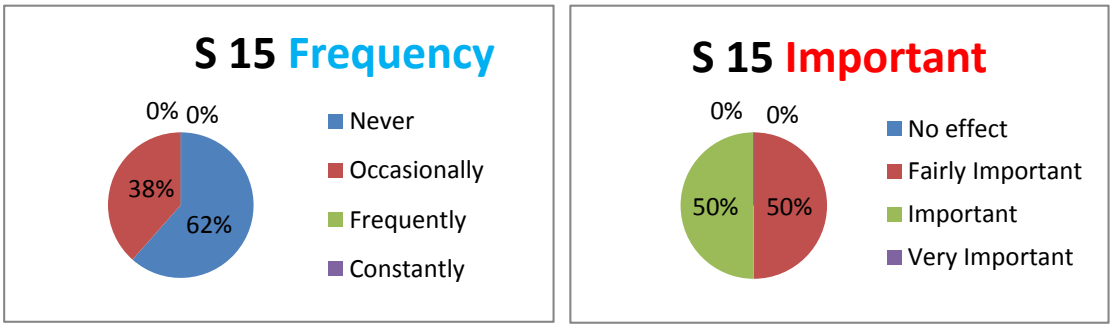

Figure 6-25: The shortage of required equipment.

Project Finance

16. Difficulties in financing the project by the department.

Statment 16							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
0	20	19	0	0	0	25	14

Table 6-26: Difficulties in financing.

Almost all the participants who are agreed as seen in table 6-26 that there were difficulties in financing the project. 51% said occasionally and 49% said frequently.

In other hand 14 participants said very important and 23 participants considered it important to have right financing to complete the job.

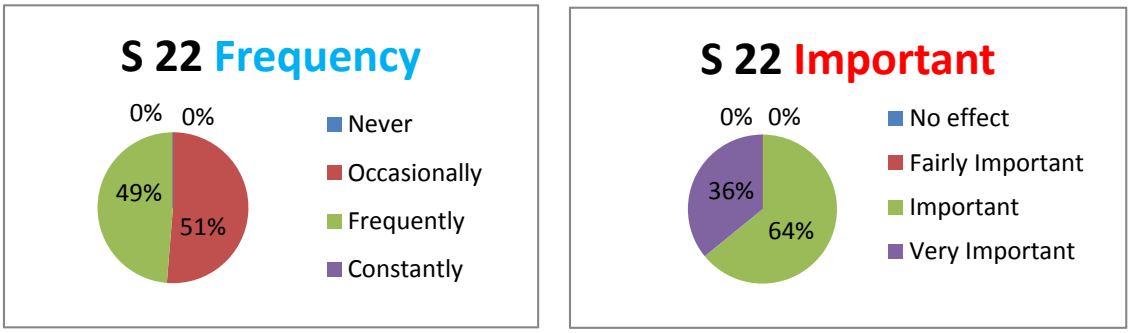

Figure 6-26: Difficulties in financing.

Does your central IT department at the airport regularly analyse its performance using the following methodologies?

17. Performance metrics.

Statement 17							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
4	16	19	0	0	0	31	8

Table 6-27: The performance metrics.

19 participants thought that performance metrics were used and it was considered important by 31 participants which are 79% to use performance metrics, also 21% considered it very important.

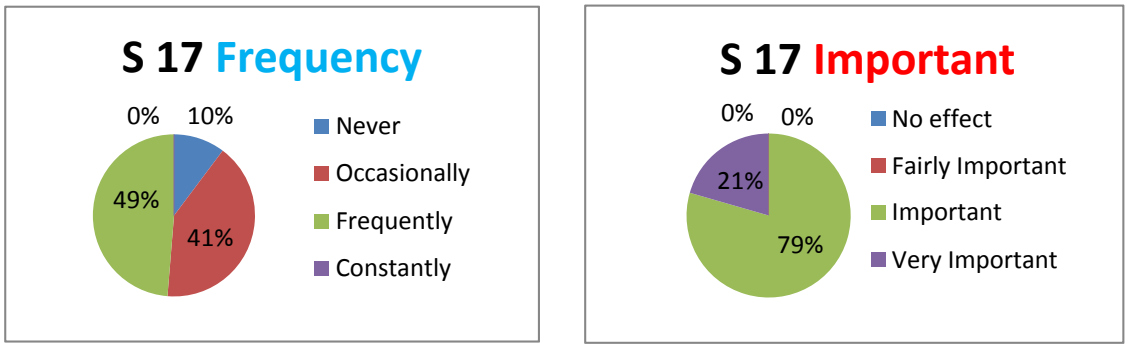

Figure 6-27: The performance metrics.

18. Self-assessment.

Statement 18							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
6	24	10	0	0	7	29	4

Table 6-28: Self-assessments.

It was found that 60% thought self-assessment was carried out and 29 participants considered it important which are 73% of total participants.

18. Self-assessment.

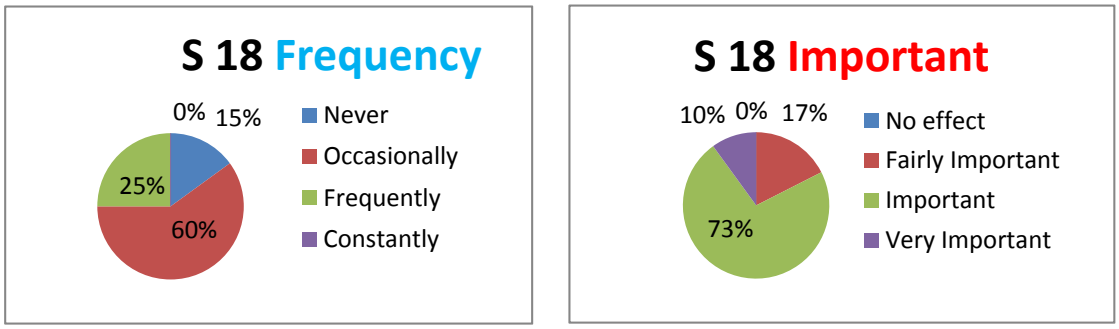

Figure 6-28: Self-assessments.

18. Outside assessment.

Statement 19							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
21	19	0	0	0	9	31	0

Table 6-29: Outside assessment.

21 participants said that outside assessment is carried out and 19 considered it occasional activity. 31 Participants thought it was very important to get the outside assessment done. 22% of the participants thought it were fairly important to do the outside assessment.

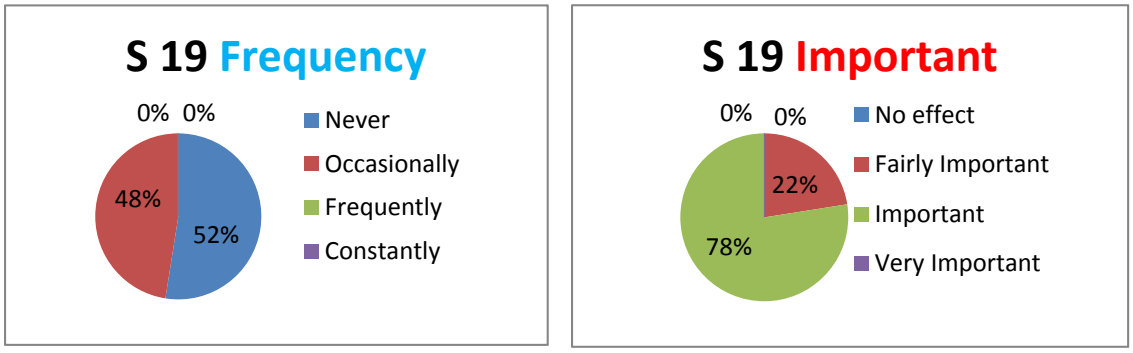

Figure 6-29: Outside assessment.

IT Impact.

State your opinion about the impact that IT planning had on the following.

20. Orienting a new leader to the state of IT at the institution.

Statement 20							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
0	40	0	0	0	16	24	0

Table 6-30: Orienting a new leader of IT at the institution.

In table 6-27 it was told by 40 participants that it is occasional to orient a new leader to the state of IT at the institution and it was considered important by 24 Participants. Whereas 16 participants which 40% of the total considered it fairly important.

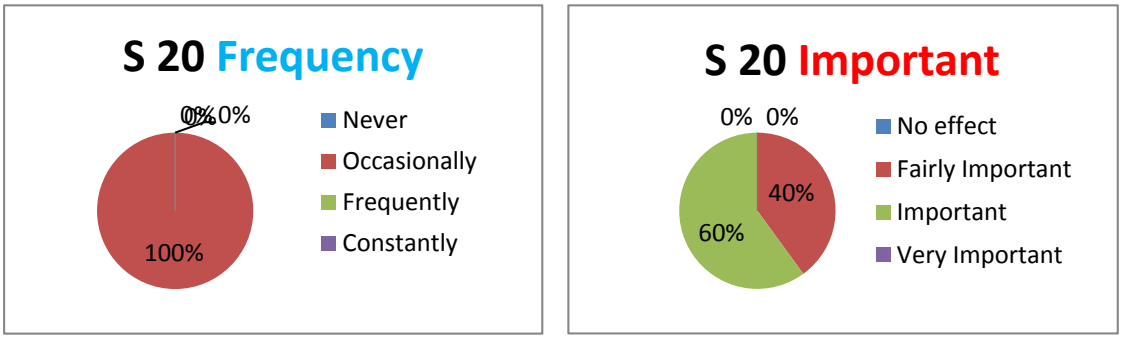

Figure 6-30: Orienting a new leader of IT at the institution.

21. Increasing top management support.

Statement 21							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
0	24	0	16	0	0	34	6

Table 6-31: Increasing top management support.

24 Participants considered it occasional task to increase top management support where as it was considered important job to increase the top management support by 85% of the participants as shown in figure 6-27.

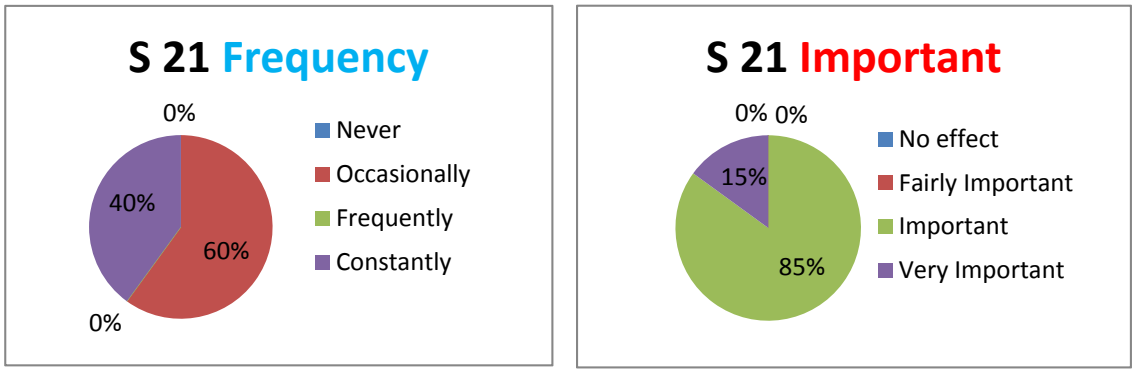

Figure 6-31: Increasing top management support.

Please tell us how often your IT department at the airport seeks input from the following.

22. Passengers satisfaction surveys to keep in touch with the emerging needs of passengers?

Statement 22							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
0	12	28	0	0	28	12	0

Table 6-32: Use of passengers' satisfaction surveys.

The participants considered that passenger satisfaction surveys were undertaken frequently. They were also considered a fairly important task by 28 of the participants. 12 participants (30%) thought it was important task to undertake passenger satisfaction surveys.

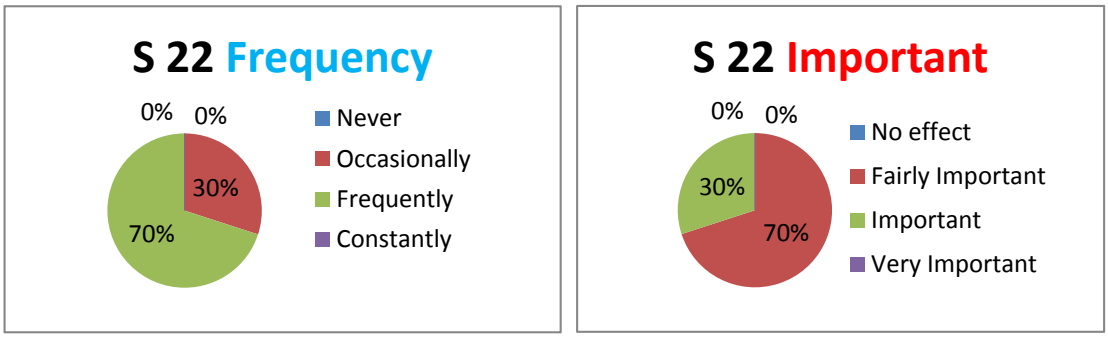

Figure 6-32: Passengers' satisfaction surveys.

23. Formal meetings.

Statment 23							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
0	21	19	0	0	2	15	23

Table 6-33: Formal meetings.

It was found that many participants considered it frequent part of the project and it 23 Participants said it was very important to have formal meetings on the project. 15 Participants, which are 37% of the total, considered it important job.

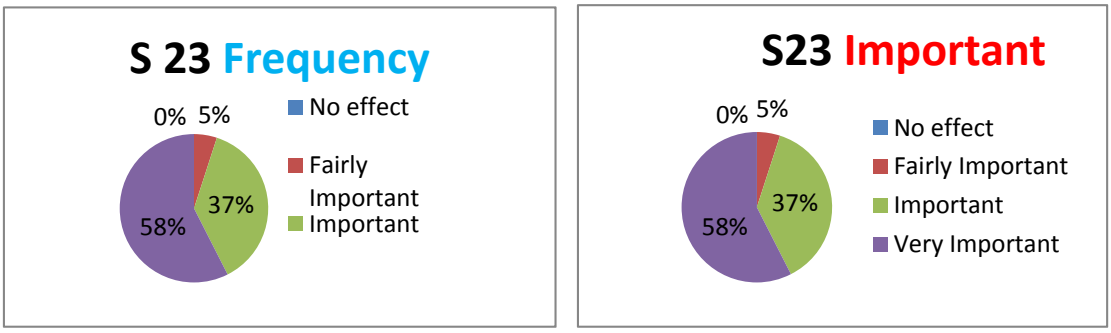

Figure 6-33: Formal meetings.

24. In-service training sessions.

Statment 24							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
0	17	23	0	0	0	22	18

Table 6-34: In-service training sessions.

23 participants said it was frequently needed to do training sessions and it was considered very important task by 18 of the participants, whereas 22 participants said it was important to do training sessions.

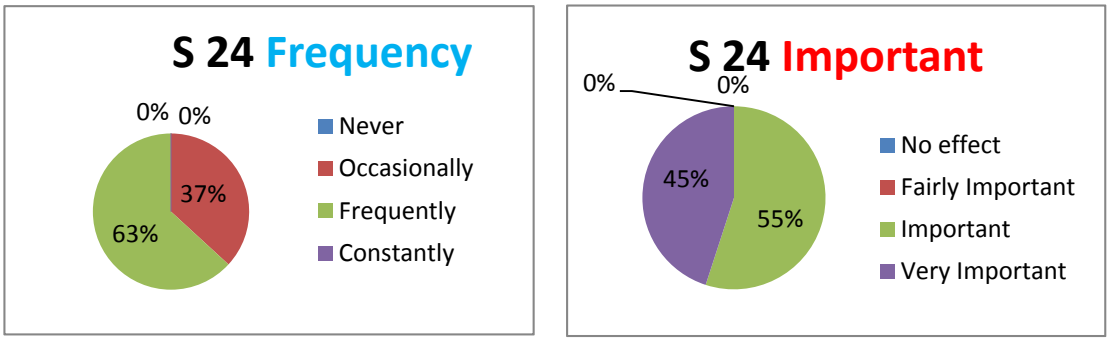

Figure 6-34: In-service training sessions.

Statement 25							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
8	27	4	0	0	0	26	13

Table 6-35: Secretary of the People's Committee of the Airport.

27 participants stated that occasional input was received from the Secretary of the People's Committee of the airport. 26 participants considered it important, and 13 very important, to receive input from the Secretary of the People's Committee of the airport.

25. Secretary of the People's Committee of the Airport.

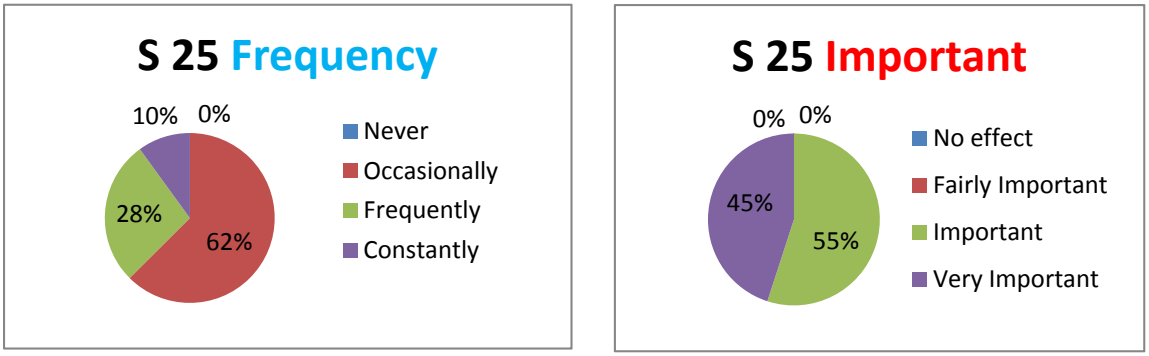

Figure 6-35: Secretary of the People's Committee of the Airport.

26. Chief Administrative Officer.

Statement 26							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
0	39	0	0	0	0	26	13

Table 6-36: Chief Administrative Officer.

All participants (see table 6-36) considered it an occasional task to receive input from the Chief Administrative Officer. 26 thought it was very important to obtain input from the Chief Administrative Officer; the rest said very important.

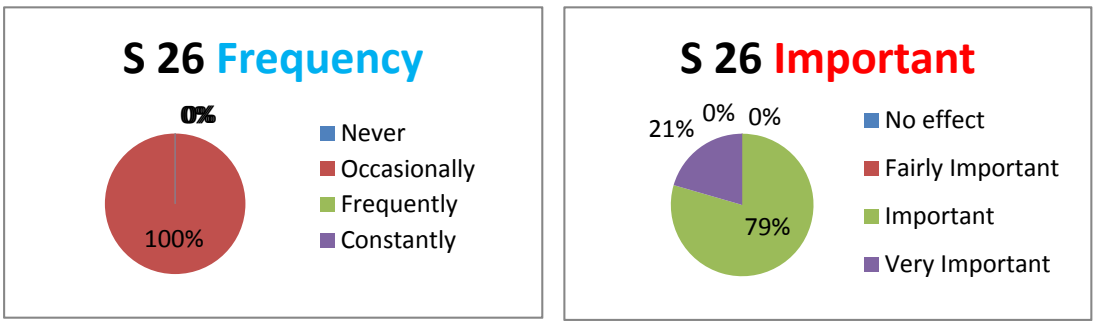

Figure 6-36: Chief Administrative Officer.

27. General Director.

Statment 27							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
0	14	24	0	0	8	9	17

Table 3-37: General Director.

24 participants thought that input was received from the General Director frequently. 17 participants thought it was very important to obtain input from the General Director. 21% thought it was fairly important to obtain input from the General Director.

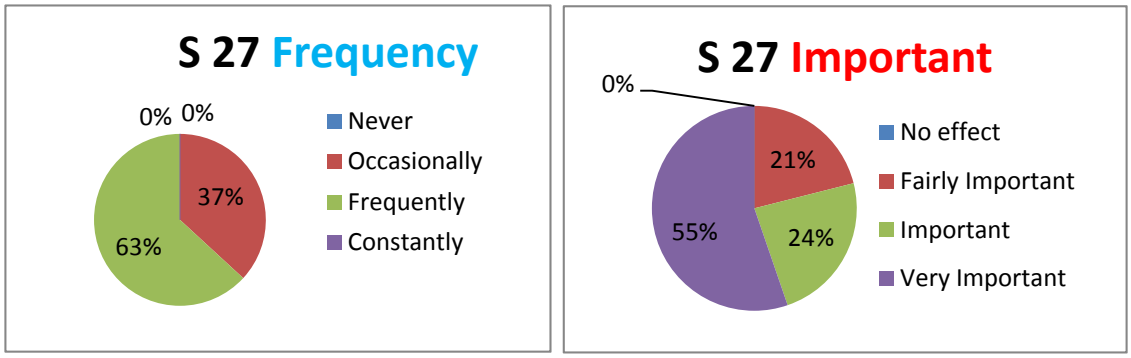

Figure 6-37: General Director.

28. IT members.

Statement 28							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
8	27	4	0	0	0	26	13

Table 6-38: IT members.

27 participants considered it that is was an occasional task to get input from IT members where as many members thought It is important to get input from IT members. 13 Participants said its very important see table 6-38.

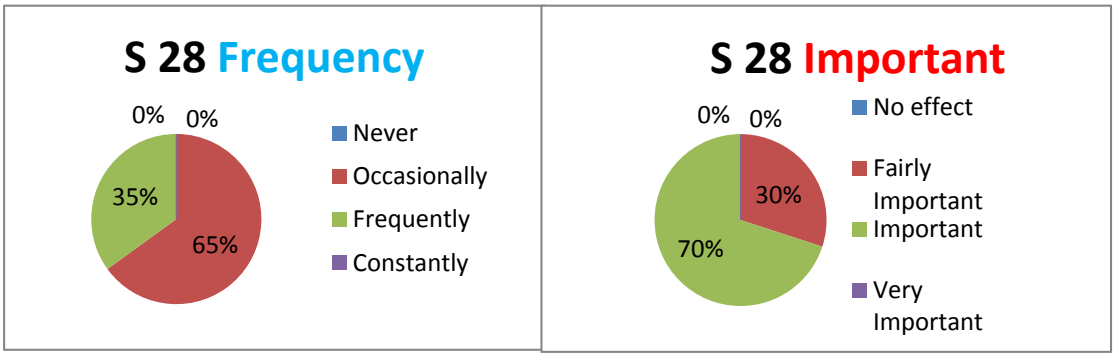

Figure 6-38: IT members.

Please tell us how often and how important it is that your IT department at the airport deals with the following.

29. Poor qualifications of IT consultants within the engineer's staff assigned to the airport.

Statement 29							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
39	0	0	0	0	22	18	0

Table 6-39: Poor qualifications of IT consultant engineers

As shown in table 6-39 the participants stated that consultant staff with poor qualifications was never employed. All participants considered it important and or fairly important to get the right consultant for any IT assignment. 22 participants (55%) said it was fairly important and 18 participants (45%) said it was important.

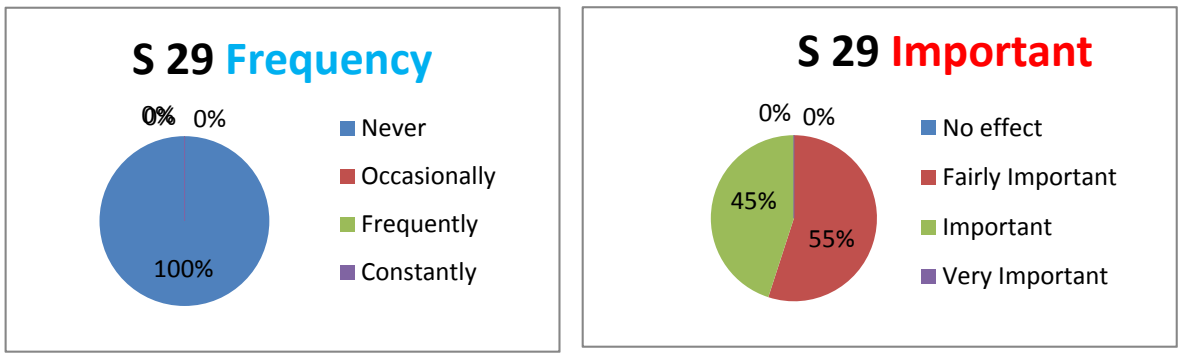

Figure 6-39: Poor qualifications of IT consultants within engineer's staff

30. Delay in IT management consultation.

Statement 30							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
21	19	0	0	0	16	24	0

Table 6-40: Delay in IT management consultation.

Almost 50% of the participants thought that there was a delay in the implementing IT management consultation in projects. 24 participants stated that it was important for projects not to have delays in management consultation.

30. Delay in IT management consultation.

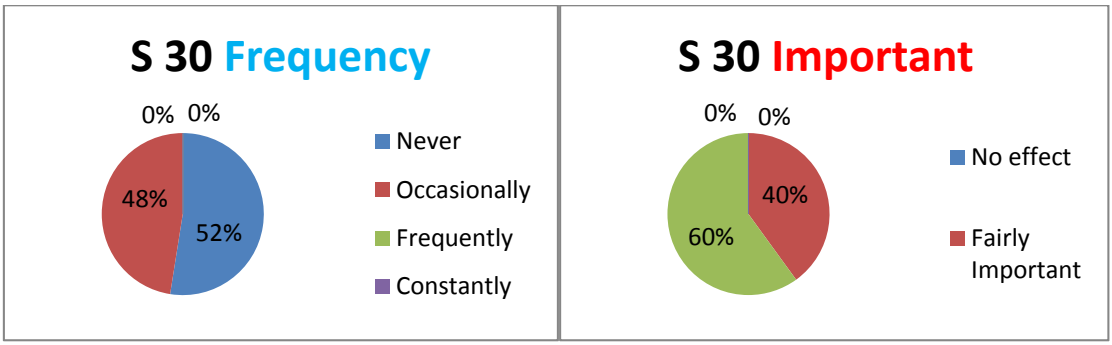

Figure 6-40: Delay in IT management consultation.

31. Poor communication between the IT consultant engineers and other parties involved within Airport.

Statement 31							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
18	22	0	0	0	24	13	2

Table 6-41: Poor communication between the IT consultants.

Almost 50% of the participants thinks there is poor communication between the two parties whereas 24 of participants thinks it's fairly important to have good communication between the two parties.

31. Poor communication between the IT consultant engineers and other parties involved within Airport.

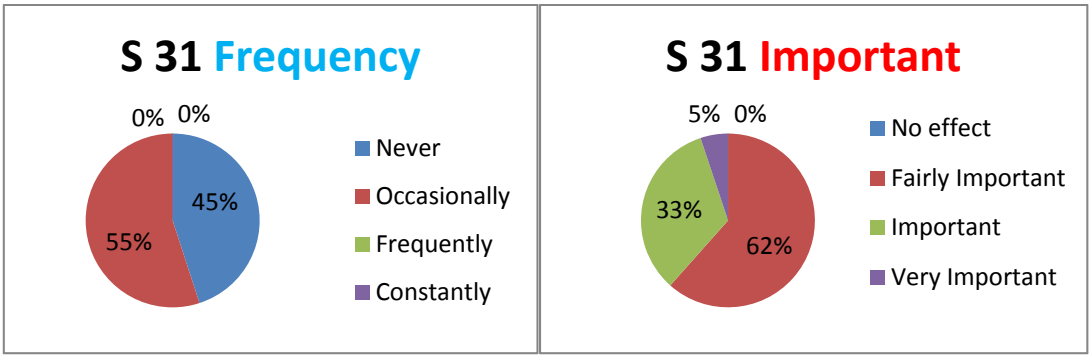

Figure 6- 41: Poor communication between the IT consultants.

32. Poor IT contract management.

Statement 32							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
30	10	0	0	0	0	32	8

Table 6-42: poor IT contract management.

30 Participants thought it was never poor IT contract Management but 32 participants thought it was important to have good IT contract Management. 20% thought it was very important.

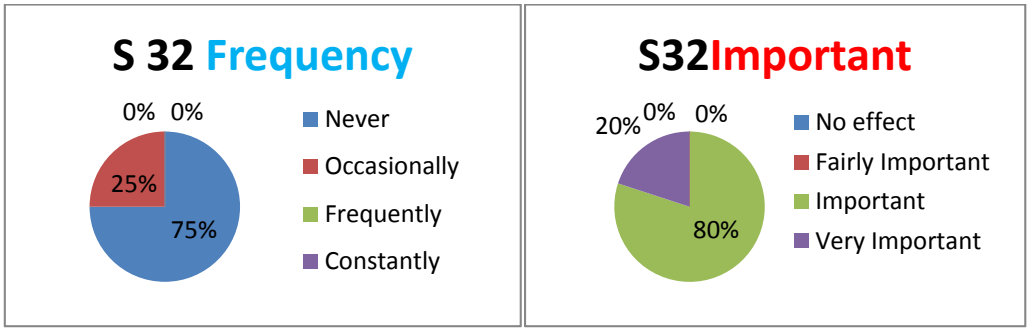

Figure 6-42: Poor IT contract management

33. Slow decision making by the organisation.

Statement 33							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
14	26	0	0	0	0	35	5

Table 6-43: Slow decision making by the organisation

26 Participants thought table 6-43 was occasional to make to slow decision by organisation where as it was considered important by 35 participants, which is 87% of the participants to have timely decision by organization

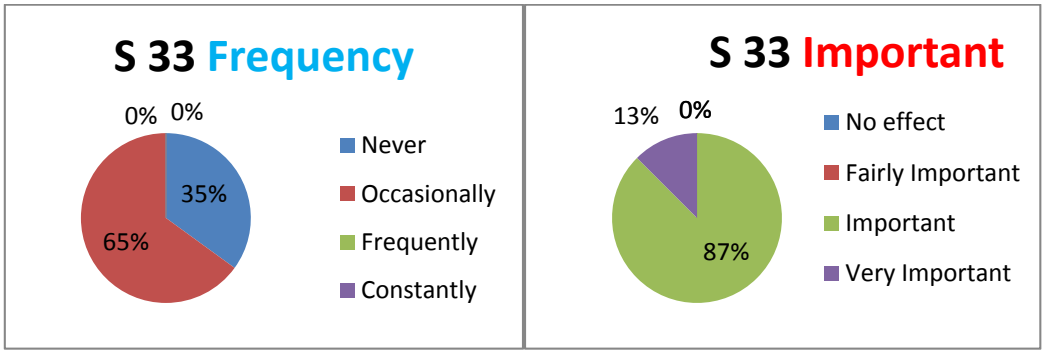

Figure 6-43: Slow decision making by the organisation.

CAA Regulations

34. Difficulties in obtaining work permits

Statement 34							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
15	25	0	0	9	28	3	8

Table 6-44: Difficulties in obtaining work permits.

15 participants thought it was never a difficult job to obtain a work permit whereas 28 participants thought that it was fairly important to obtain the work permits on time.

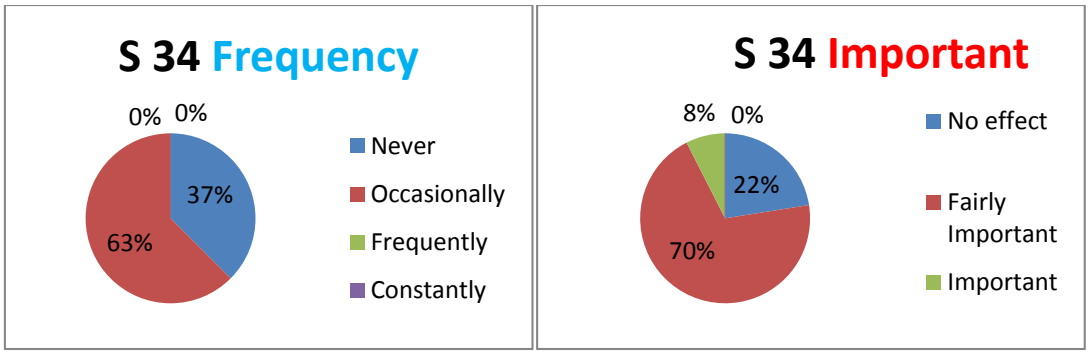

Figure 6-44: Difficulties in obtaining work permits.

35. Changes in government regulations and laws.

Statement 35							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
0	12	23	0	0	22	15	0

Table 6-45: Changes in government regulations and laws. Participants stated that it was frequent to see changes in government regulations 22 participants (59%) (see figure 6-45) thought the effects of changes in government regulations was fairly important.

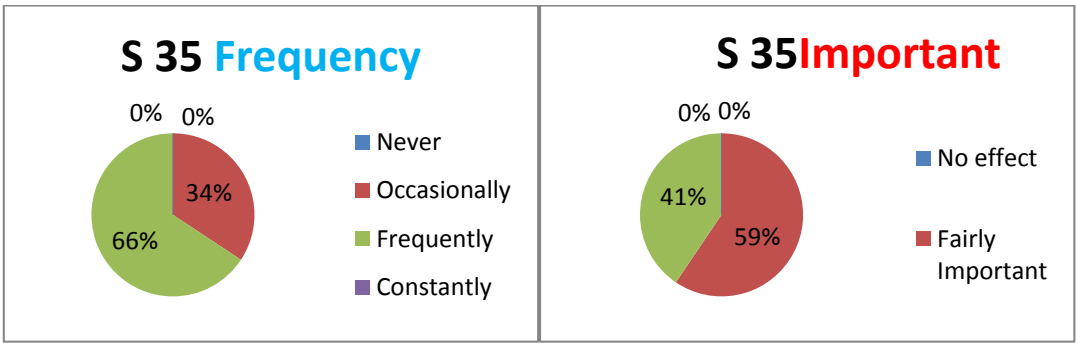

Figure 6-45: Changes in government regulations and laws.

36. Severe problematical conditions on the job site.

Statement 36							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
13	27	0	0	0	0	33	7

Table 6-46: Severe problematical conditions on the job site.

27 participants thought it was 'occasional' to see severe problematical conditions on job sites. 33 thought it was important not to have severe conditions and just 7 participants (18%) stated that it very important not to have severe conditions.

36. Severe problematical conditions on the job site.

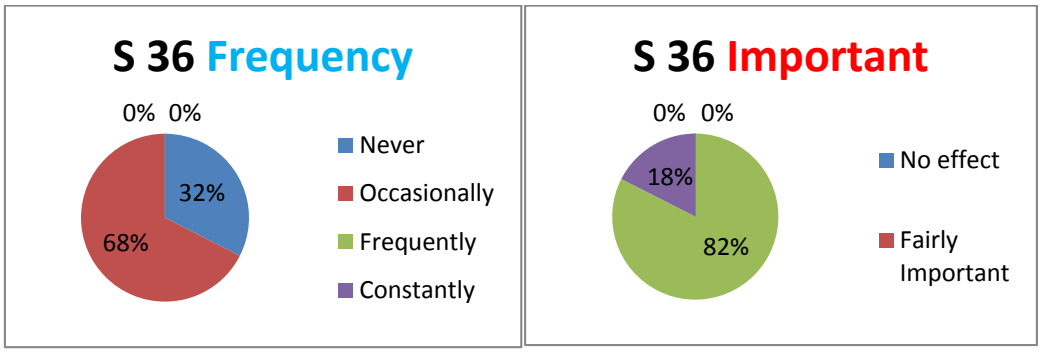

Figure 6-46: Severe problem conditions on the job site.

37. Effects of social and cultural conditions on IT implementation

Statement 37							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
1	39	0	0	0	0	27	11

Table 6-47: Effects of social and cultural conditions for IT Implementation.

Almost all participants thought it was 'occasional' to see the effects of social and cultural conditions on IT implementation whereas 27 participants thought it was important not to see the effects of social and cultural conditions on IT implementation.

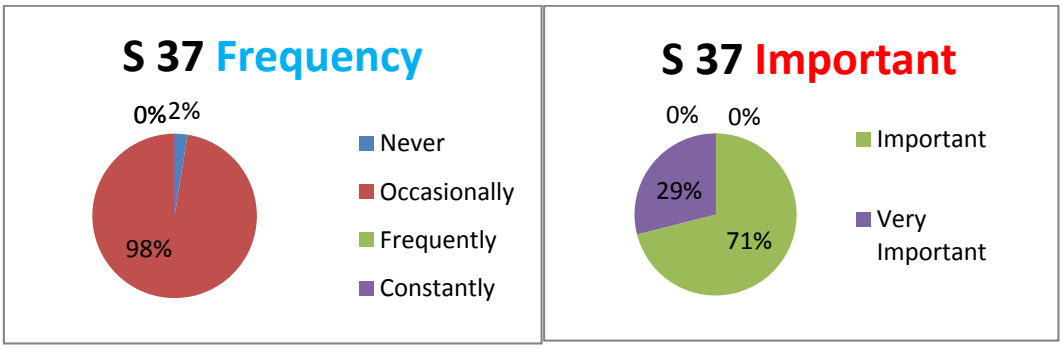

Figure 6-47: Effects of social and cultural conditions for IT Implementation.

38. Work interference between various levels of Management.

Statment 38							
Frequency				Important			
Never	Occasionally	Frequently	Constantly	No effect	Fairly Important	Important	Very Important
0	31	9	0	0	0	28	12

Table 6-48: Work interference between various levels of Management.

31 Participants said that interference between various levels of management occurred only occasionally (see table 6-48) 28 participants (70%) considered it important to avoid interference between the levels of management. 12 participants (30%) said it was very important not to have such interference.

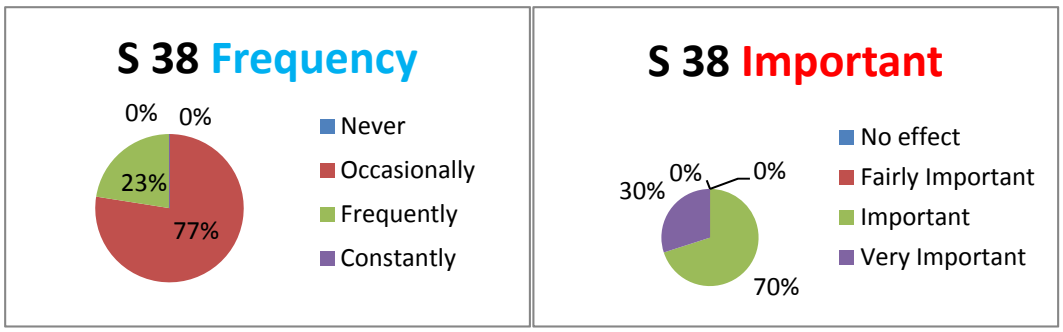

Figure 6-48: Work interference between various levels of Management

Conclusion

After undertaking an extensive questionnaire with 40 participants from different levels of staff (staff at medium levels and low levels of responsibility) working in Tripoli and Benghazi airports, it was found that there is a gap between IT management and general administrative management that leads to many problems. There was no formal communication between the two parties as was shown in the collected data. It was also found that a lack of interest of the top management caused problems as concerns leading innovative IT systems at the local airports. It was found that Libyan civil aviation has not taken serious steps in the past to bring new technology to the airports and have kept on using old classical systems. Furthermore, top management does not consider IT management to be important part of the airport's administration and has always neglected it. Participants did not believe that new people had come forward who could be a champion of IT and who could, thus, lead IT related projects to a stronger position. Most of the participants thought it was very important to have a strong IT department which would lead to easing problems of communication between departments. Such a department would also lead to easier transits for passengers travelling through these airports. Smoother passenger flows would also lead to improvement and the overall process of passengers travelling through airports would become more smooth and accurate.

The second survey undertaken was a survey conducted with passengers travelling through the airports.

2- Passengers' questionnaire.

Two of the biggest airports in Libya were selected for the passengers' questionnaire survey data collection: Tripoli airport and Benghazi airport. Within Tripoli airport there were approximately 60 passengers who were randomly selected who were in the airport the day the researcher attended. Of the 60 passengers selected, 29 responded. Within Benghazi airport there were approximately 40 passengers who were randomly selected. Of these 40 people, 11 responded.

The passengers selected for the questionnaire survey were people that the researcher did not know personally. The researcher did not have option to pick people who are reliable and could be counted on to respond to the questionnaire and provide honest and reliable data. The researcher was there to collect the questionnaire as soon as possible because most of passengers were in a hurry to catch a flight if they are flying, or are going home if they had just arrived.

The reason behind selecting passengers to undertaken this questionnaire survey alongside the airports' employees is because these are the people who should be considered. They are not the decision makers but they will be the ones affected if there is better IT implementation within the airports.

The empirical survey for this study on IT Strategy Implementation at Libyan Airports utilised a sample of 40 passengers who were selected based on their air travel experience in the selected study locations. These respondents were contacted inside the airports and the questionnaires were given to them for completion in person. Of the 100 questionnaires distributed, 40 of them were returned (from both airports, Tripoli airport and Benghazi airport) as mentioned above. However, sections of the questions showed anomalies in the responses expected and there were omissions too. Below is the analyses based on the responses given.

Question 1 enquired about the geographical original location of the respondent on a continental basis as follows: Africa, Middle East, Far East, Europe, America, other. The responses are captured in the figure 6-49.

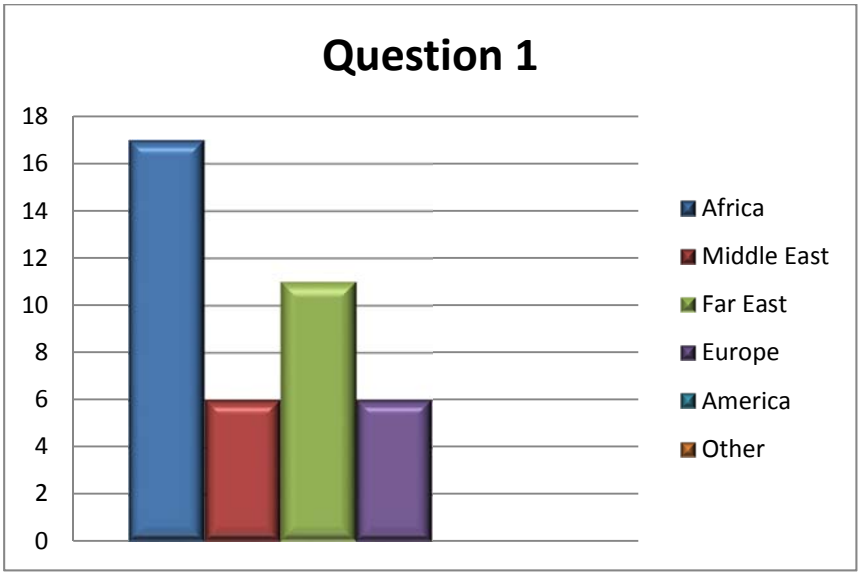

Figure 6-49: Participants' original geographical location

As shown in figure 6-49, the majority of the respondents (17 respondents or 43 percent) had their origins in Africa followed by 11 (28%) from the Far East. Respondents who hailed from America and other places not included in the list of continents provided, both scored equally at 6 respondents each (15%). Significantly, the implications of this respondents' background survey suggests an impact this will make on the study. The study is looking at an African perception of IT implementation as the study is based in Africa. However, the total number of respondents from outside the study area is high at 57 percent in total. This implies that the external impact on the study could be high but this can be advantageous as theoretical and empirical evidence suggest that good practice in IT implementation in airports is more advanced in locations outside the African continent. This will be as a result of several factors, including the availability of funds and access to technology as well as the volume of traffic in those airports and the generation of income as a result.

Questions 2 – 5 sought information about the use of the airport being studied, along with information on the general frequency of travel and how often the particular airport was used by the respondent. It further enquired about the respondent's direction of travel or destination. Figures 6-50 captures this data. 30

out of the 40 respondents answered affirmatively to the question whether they had flown through the airport concerned before. The majority at 75 percent answered yes while the remaining 10 (constituting 25 percent) had never used the airport in question (figure 6-50).

(No or Yes)

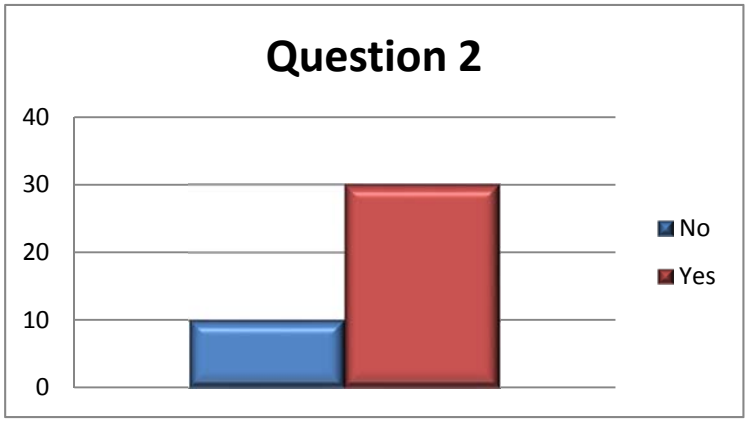

Figure 6-50: information on the use of the airport

The frequency of air travel generally (figure 6-50) and specifically through this airport (figure 6-51) formed the next subject of enquiry. 15 participants (or about 37 percent), forming the majority, rarely travelled (i.e. once in a year) whereas just under that figure (at 14 participants or 35 percent) were frequent air travellers. The remaining 11 participants or 28 percent were in-between with the majority among them (at 9 participants) or 23 percent travelling only twice each year and the remainder (at 2 participants or 5 percent) travelling at somewhere between three and six times annually.

Question 3- How often do you travel?

(Once, Twice, More than Three Times or More than Seven Times)

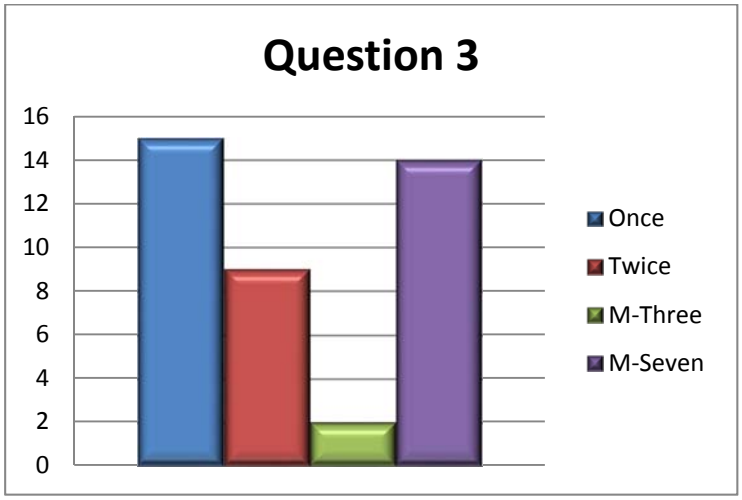

Figure 6-51: How often the participants travelled?

To gain information on their general style and pattern of travel and to ascertain their use of the airport under study, the question as to their frequency of travel through the particular airport was asked. Confirming the earlier pattern, the largest number of respondents (at 21 participants or 53 percent) took a trip by air only once through the particular airport, followed by a further 11 participants (or 28 percent) who undertook two or three trips per year and finally 8 participants (or 20 percent) travelled three or more times through the particular Libyan airport. Figure 6-52 shows these results pictorially for an easier understanding of the situation.

Question 4- How frequently do you travel through this airport?

(Once a Year, Two to Three Times a Year or Three to Five Times a Year)

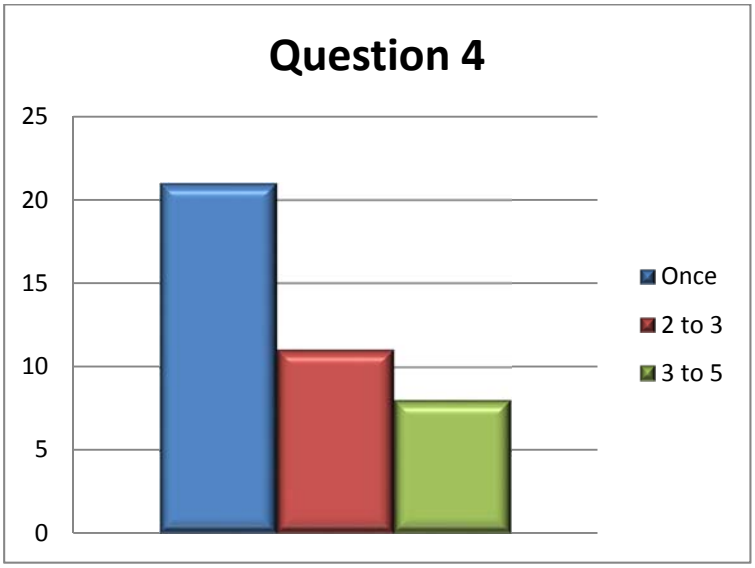

Figure 6-52: Frequency of travel through that particular airport.

Question 5- Where are you going to?

(Africa, Middle East, Far East Europe, America or other)

With respect to the direction of travel of the passengers or travel destinations, the majority (16 participants or 40 percent) were recorded as heading for Europe while the least number (5 passengers or 10 percent) were heading to African destinations. 8 passengers (or 20 percent) and 11 passengers (or 28 percent) were travelling through the airport to destinations in the Middle and Far East respectively.

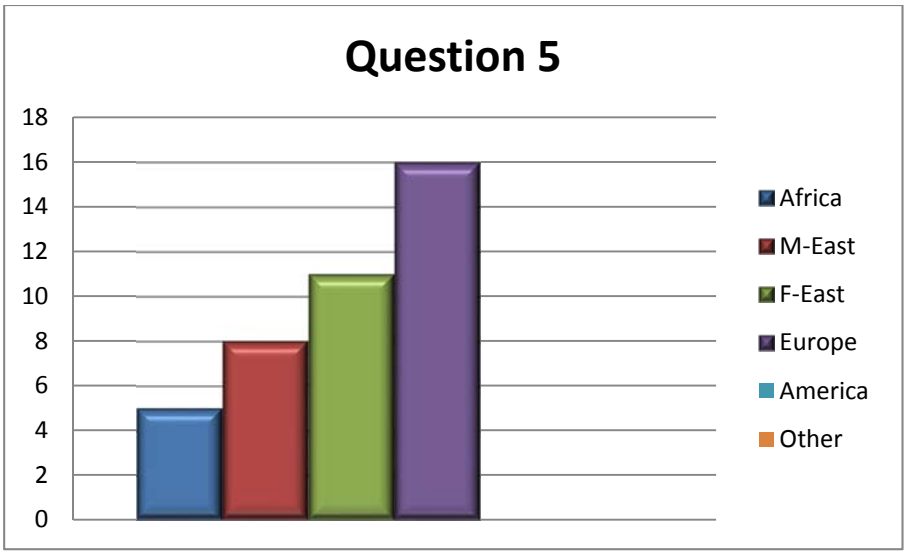

Figure 6-53: Passenger destinations

Having ascertained the pattern, style and mode of travel of the passengers, the questionnaire asked for their perception of the airport facilities (in terms of easing their embarkation and disembarkation) of flights to and from their destinations formed the basis of the next set of questions. Based on a ranking within a four-point Likert scale style ranging from excellent to poor, figure 6-54 depicts how the respondents felt about the check-in arrangements at the airport.

Question 6- How did you find the check-in arrangements at this airport?

(Poor, Good, Very Good or Excellent)

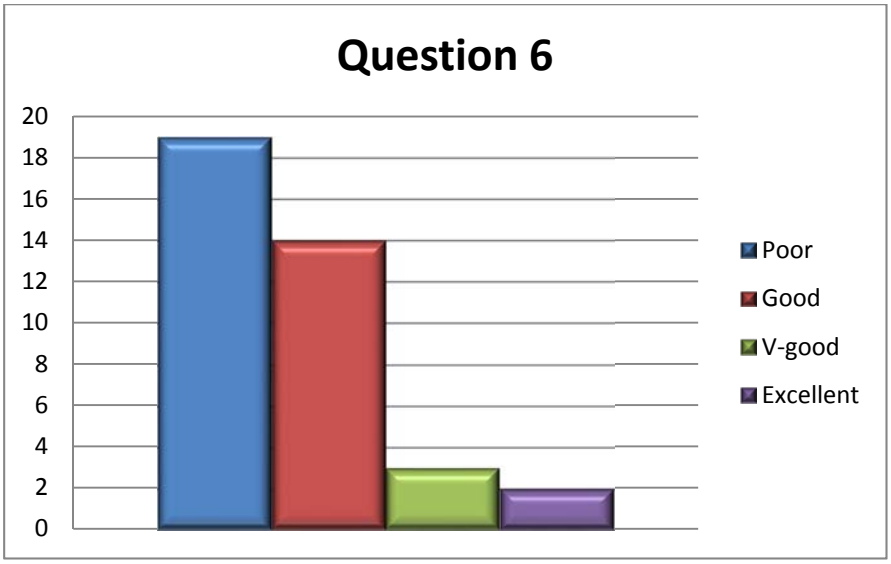

Figure 6-54: Check-in arrangements at the airport

As shown in figure 6-54 above, the majority of the passengers rated check-in arrangements as being poor. In fact, as 19 respondents (48 percent) rating the check-in arrangements as being poor and a further 14 (35 percent) rating their experience as good and few participants rating check-in as either very good or excellent, this leaves much to be desired in this respect. Therefore, the overall impression given is of a substandard service (irrespective of the 3 passengers (about 8 percent) and 2 passengers (at 5 percent) receiving outstanding check-in service by providing very good and excellent ratings respectively. That said however, considering that the majority of respondents were heading to Europe where they had probably been exposed to outstanding service, it is not surprising that these passengers would have such perceptions as they would normally expect better and comparable service similar to the service to which they had been exposed elsewhere in Europe.

The very few who viewed the service differently and rated it as very good and excellent, in all likelihood, could either have been having their first experience of air travel (with no benchmark for assessing their experience) or they may have belonged to the fortunate few whose wealth or authority could afford them silver service in places like this. Such fortunate few usually have other people to undertaken the check-in for them or they generally do not go through the same process as the majority of the passengers.

In figure 6-55, the views of the respondents on the IT system at the airport (being the machinery for undertaking the check-in service) was ascertained. The level of sophistication, or otherwise, of these systems in their operation and use will determine how passengers' perception of such facilities will be formed.

Question 7- How did you find the IT system in this airport?

(Poor, Good, Very Good or Excellent)

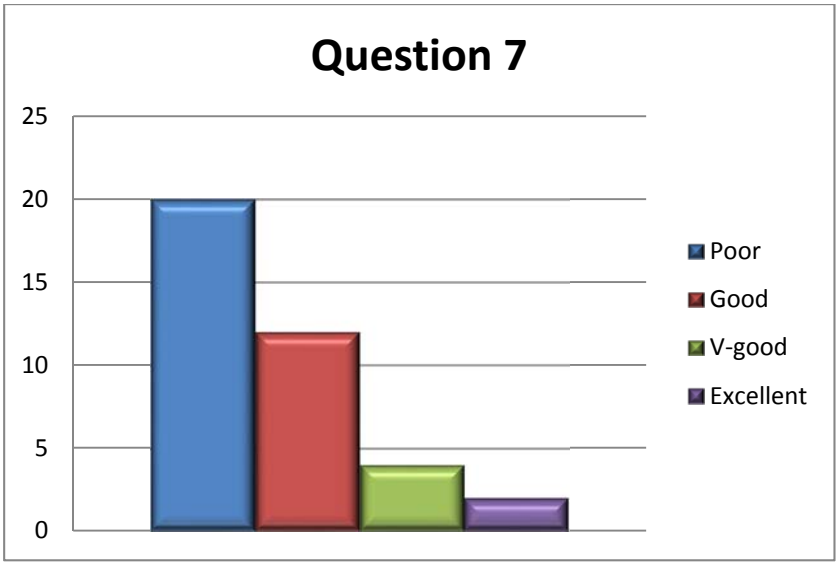

Figure 6-55: Passengers' rating of the IT system in the airport

In figure 6-55, 20 respondents (50 percent) and 12 respondents (30 percent) observed the IT system at the airport as being of poor / good quality and service. 4 respondents (10 percent) and two respondents (5 percent), however, saw the system as very good and excellent (similar ratings as for question6 where they assessed the check-in process). Thus the reliability of their perceptions is affirmed since the facilities for expediting the process (IT systems) and the service (check-in) are interlinked and better IT systems will yield better and speedy service thus excellent check-in and vice versa.

Size is an issue although judgments depending on the measurement or the speed of IT systems may not necessarily be size related, at least in modern times. However, in most cases larger IT systems have been known to have larger memories/processors and, therefore, tend to process data faster thus yielding

faster and better service. It is because of this that the question sought to find out from respondents what their views were on the size of the IT systems at the airport.

Question 8- What is/are the size of IT system(s) in this airport?

(Large, Medium or Small)

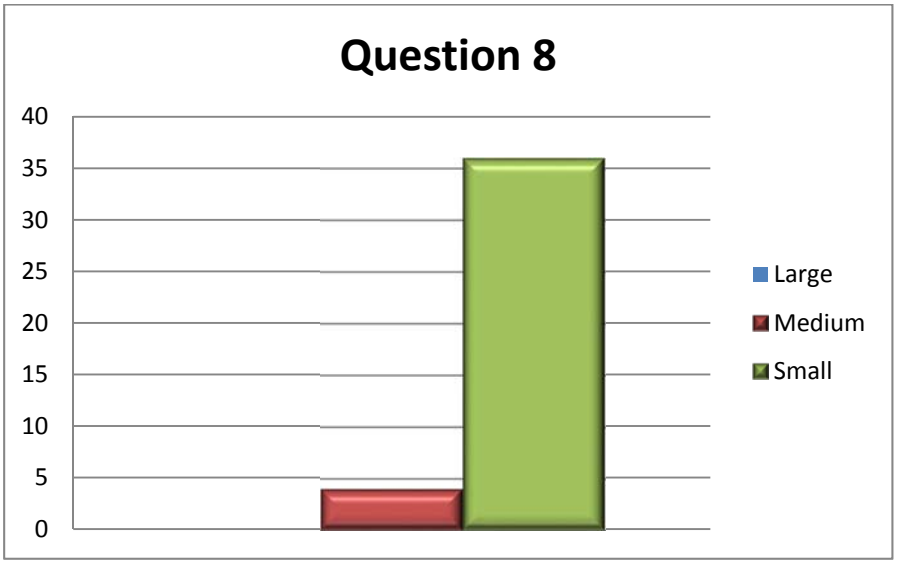

Figure 6-56: Size of IT systems at the airport

As can be seen from figure 6-56, an overwhelming majority (36 participants or 90 percent) saw the IT systems as small with only 4 thinking the system was of medium size. Unsurprisingly, none saw it as big and this further backed up the responses shown in figures 6-54 and 6-55. It also reinforced the responses given in question 9 as to whether the electronic display boards in the airports giving information on departure gate numbers and departure times (as shown in Figure 6-56) might behave erratically.

Question 9- How often do the electronic indicators and airport guidance systems work (the electronic display boards on platforms that display gate numbers and departure times)?

(Always, Mostly, Sometimes or Never)

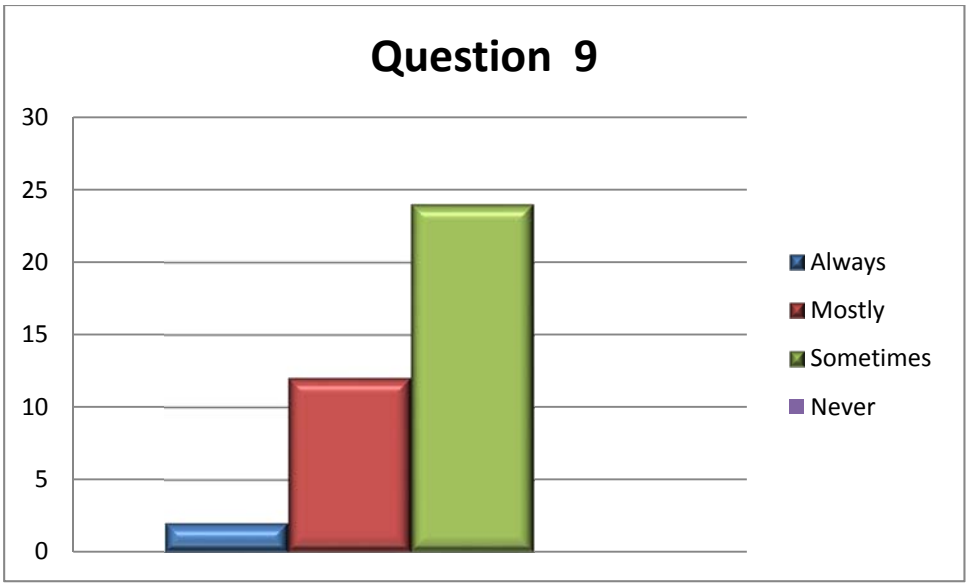

Figure 6-57: The working of electronic indicator and airport guidance system

As can be seen in figure 6-57, the largest number of respondents (at 24 participants thus 60 percent) thought the directional indicators worked only sometimes. 13 respondents (about 32 percent) and 2 participants (5 percent) stated that the signs worked mostly and always respectively. Their responses seem to indicate that the situation is redeemed somehow and is not as completely hopeless as the other scores seemed to suggest. Therefore, the reliability of these displays, based on the accuracy of the information given, was also put to test with the respondents. Their responses are depicted in figure 6-58.

Question 10- Do the electronic display boards display accurate information?

(Always, Mostly, Sometimes or Never)

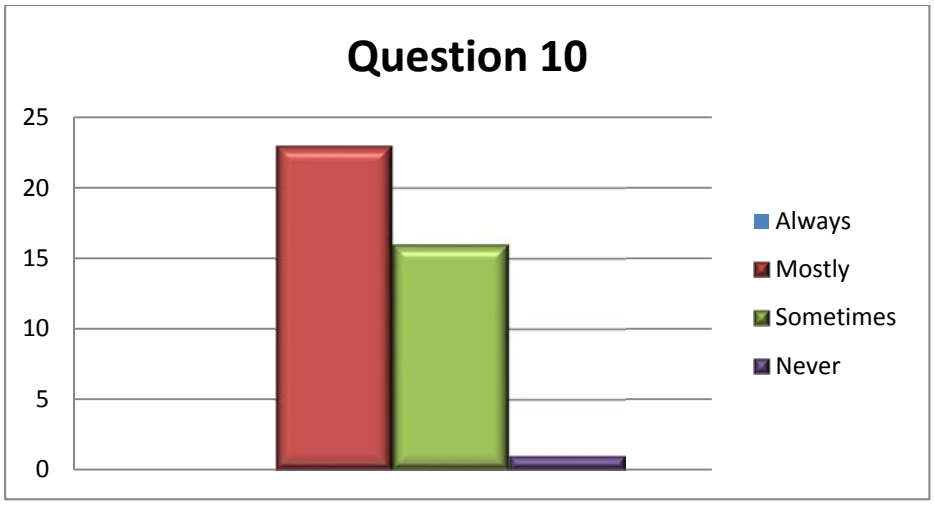

Figure 6-58: Responses to the question; do the electronic display boards display accurate information?

Figure 6-58 captures how the IT systems portray accurate information at the airports in the study. All 40 respondents gave their reactions to the question. Out of these, 23 participants (or about 58 percent) were convinced that the systems displayed accurate information. A further 16 respondents (40 percent) thought that the information displayed was only accurate sometimes, while 1 respondent (about 3 percent) felt that the systems never displayed any reliable information. The last view seems too critical though considering the majority believing information provided was mostly accurate and hence reliable. However, it is not too surprising as none of the respondents vouched to say the information supplied by these systems were always accurate and reliable.

Air travel depends on timely operations for 'time is money' and the only time an aeroplane makes any income is when it is up in the air. Timeliness and clarity of announcements within airports are important factors in making this happen. This is captured in figure 6-59.

Question 11- Are the announcements timely and clear?

(Always, Mostly, Sometimes or Never)

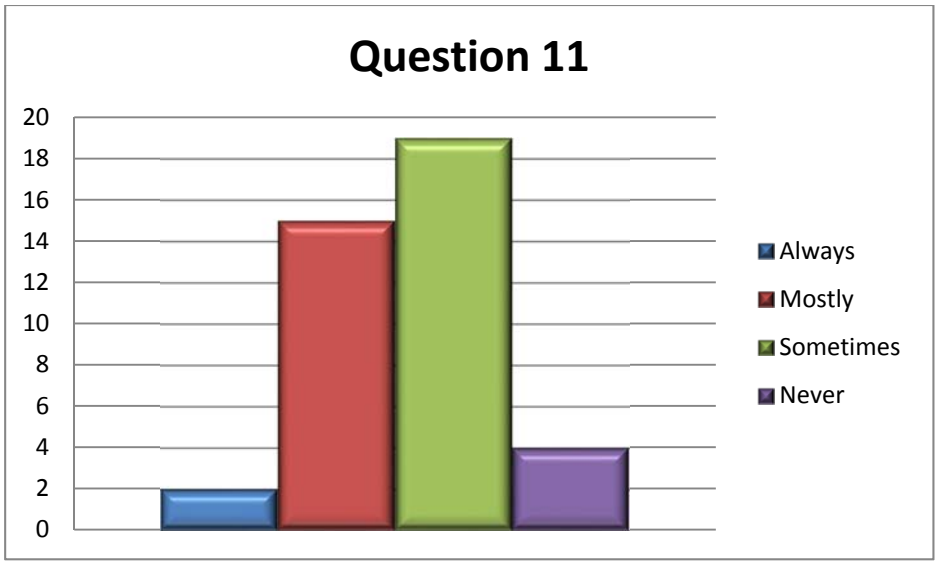

Figure 6-59: Whether the airport announcements timely and clear

Disappointingly, the data captured in figure 6-59 fails to give any positive indication on the issue here. The majority of the respondents (19 participants or 48 percent) believed that timeliness and accuracy of information happened only sometimes. However, a significant number (15 participants or 38 percent) also stated that these systems' announcements were timely and accurate most of the time with a further 2 participants (5 percent) noting that they were always accurate, and hence reliable. In any case, for 4 participants to think that the worst scenario was the case (by stating that the systems' information was never timely nor accurate) is disturbing and calls for action.

The information given by the participants in response to the questions prior to this stage would suggest that departures very much suffer delays. Notwithstanding this, there seems to be some encouragement in that almost half of the participants believed that departures were mostly on time.

Question12- Departure from your embarking airport

(Always on Time, Mostly on Time, Sometimes on Time or Never on Time)

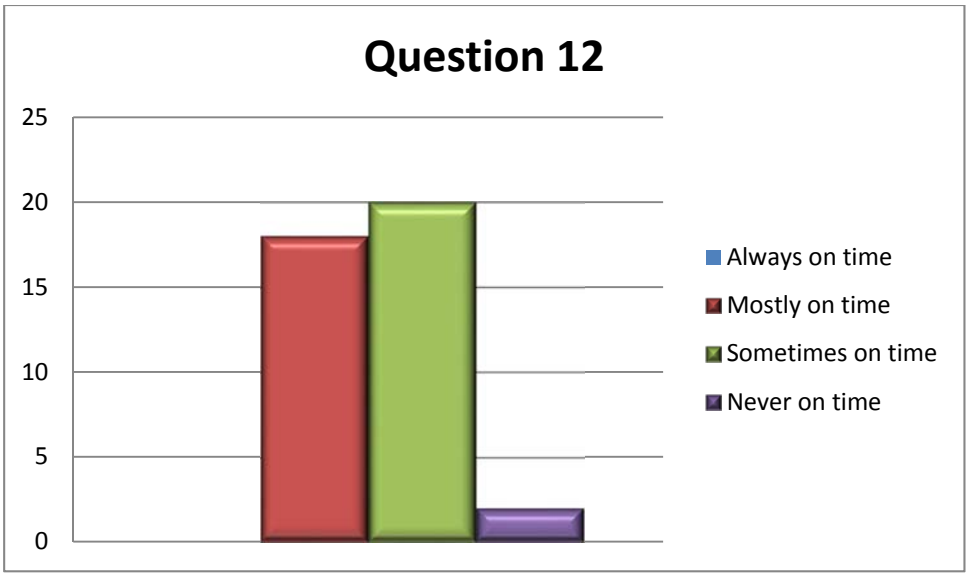

Figure 6-60: Departure from your embarking airport

As shown in figure 6-60 none said departures were always on time which is, indeed, the reality, as this is the case for every airport irrespective of advancement as even the top notch airports miss this mark. As indicated, for 18 participants (45 percent) to believe that the flights mostly left on time was somehow encouraging, although 50 percent (20 participants) viewed departures as being 'sometimes on time' which is on the down side. 2 passengers (5 percent) believed departures were never timely.

Question 13- How do you rate your overall experience of the services provided by the airport on a scale of 1 to 10?

(1st is the lowest grade and 10th the highest grade).

1 2 3 4 5 6 7 8 9 10

On a scale of 1-10 with 1 being the least satisfied with the experience of the services provided by the airports and 10 giving the most satisfaction, users of the airports appeared generally dissatisfied. Again, all forty respondents answered the question with the majority (14 persons or 35 percent) suggesting that they were less than averagely satisfied with the services on offer.

A further 12 or 30 percent were slightly more satisfied with the services at 1 point extra on the scale. Indeed this implies that things do not augur well for the passengers in respect of the services received.

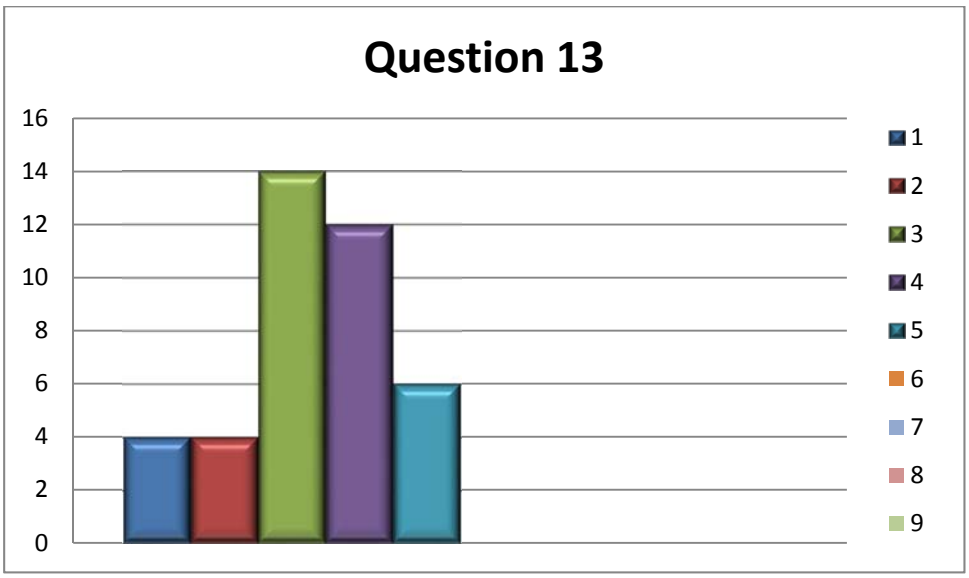

Figure 6-61: Overall experience of the services (on a scale of 1 to 10)

As can be seen in figure 6-61, 6 of the passengers (accounting for 15 percent of the total number of passengers) felt that the services merely gave them an average satisfaction. Contrary to this, 4 participants (10 percent) had ranked their satisfaction as being on level 1 (being the least satisfied) and level 2, being just a step up from the least mark. The implication here, therefore, is that on all counts of probability, a lot is required to be done in this respect if passengers are to receive value for their money and for the airports to expand and grow in business in order not to be choked out of business by rival and nearby airports.

14- How do you rate the value of the services provided by the airlines for the price that you pay on a scale of 1 to 10?

(1st is the lowest grade and 10th the highest grade).

1 2 3 4 5 6 7 8 9 10

Again, using the same scale as in figure 6-61, the next questions sought to discover whether passengers has received value for their money. Value for money provides a strong business case as it is through such means that issues relating to repeat business and customer continuity can be addressed in a positive manner.

Customers may be dissatisfied with a service but they may ignore this if they feel that this does not impact very much on the value received in relation to the intrinsic value in respect of the amount of money they have parted with. For example, one customer may feel the services at an airport are not overly essential as they are only a means to an end; the essential service is to embark and disembark in order to journey on to a final destination. This probably explains the varying views and perceptions on the services rendered. The outcomes of the responses are captured in figure 6-62.

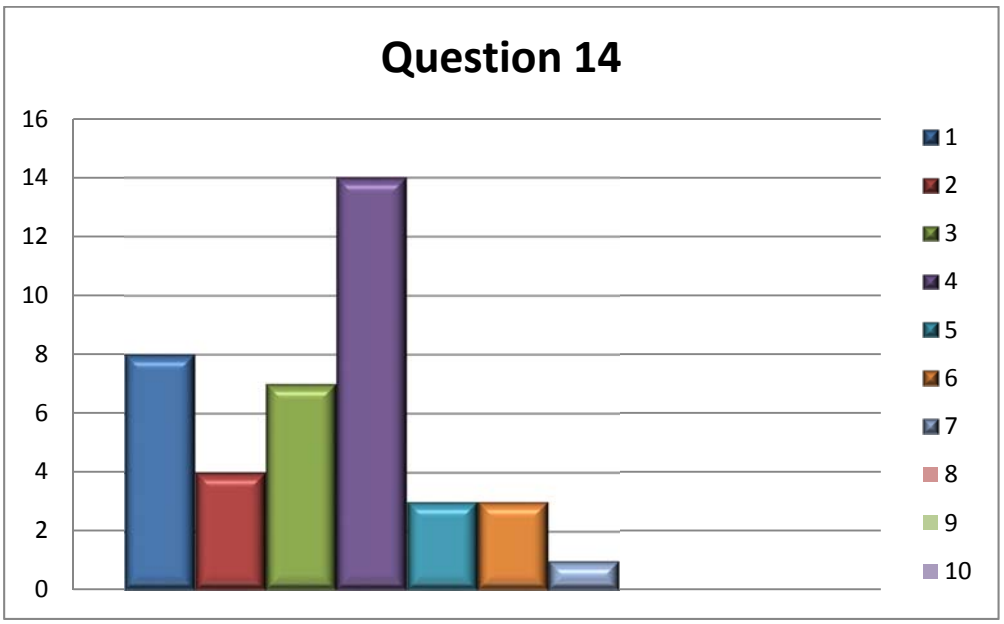

Figure 6-62: The value of services provided by the airlines (on a scale of 1 to 10)

As shown in figure 6-62, the satisfaction levels shown for the experience at the airports (which was presented in figure 6-61) varied significantly here. It would be expected that client satisfaction would very much be in line with the value the clients expect to receive from the money spent. However, as explained immediately preceding this paragraph, the passengers appear to be very satisfied with the amount of money that they have spent. As explained earlier, this may be that they are more interested in getting to their destinations and may not be bound by time limitations or delays or may not be interested in the services at the airport which are usually seen merely as transit points. Also, for the majority of passengers for whom air travel is not a regular affair, services at the airports may not mean much and may not impact on the value they expect to receive for their money. In some cases, passengers may not have paid for the flight themselves

and so feel less regarding the impact of expenditure. Furthermore, other passengers may compare the cost of flight tickets with travel to other locations and if they feel this is less, the intrinsic value they part with in respect of money spent in relation to the services at airport and their arrival at their destinations makes the services available at the airports less significant.

15- Do you feel that updated/accurate flight information is transmitted?

(Always, Mostly, Sometimes, Never or Can't Say)

Following these interesting phenomena explained above in respect to value for money, respondents were asked about how they felt about updates and the accuracy of transmitted flight information (as covered in figure 6-63). Similarly, passengers were again asked about the availability of internet or wifi access at the airports. The responses here were somewhat similar to those given earlier in respect of flight information transmission. Figure 6-64 captures the results graphically.

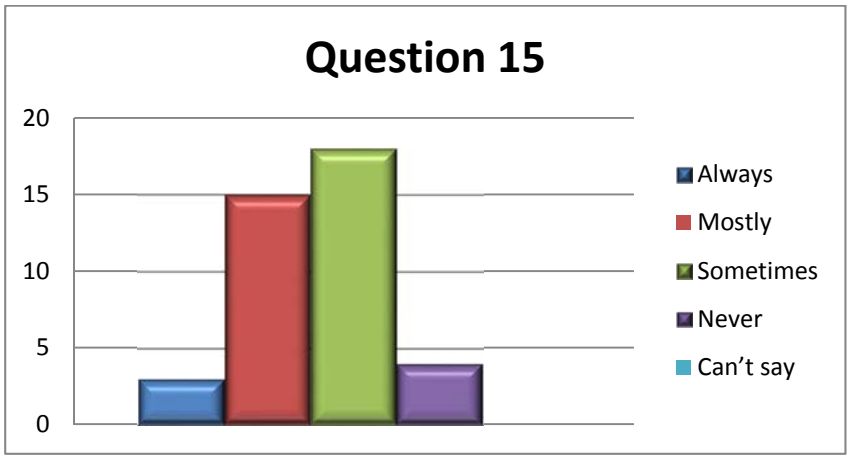

Figure 6-63: Responses to the question: is updated/accurate flight information transmitted?

Question 16- Are you able to freely access the internet/web based enquiry service at the airport?

(Always, Mostly, Sometimes, Never or Can't Say)

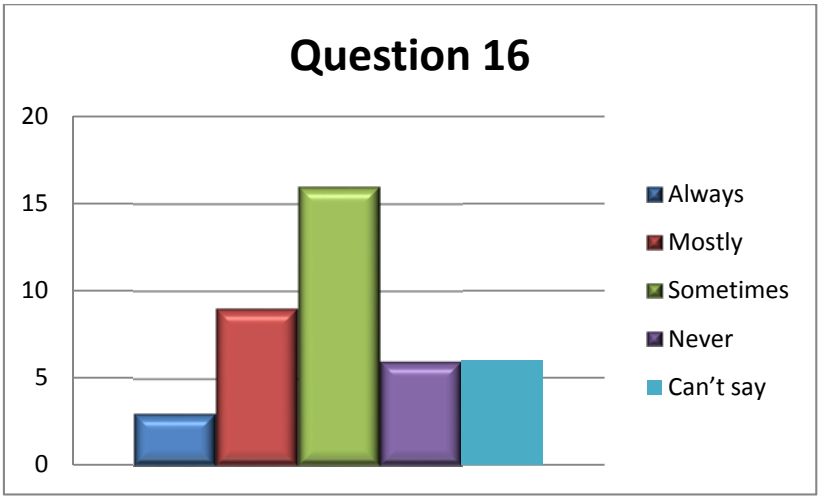

Figure 6-64: Free access to the internet/web based enquiry service at the airport

As shown in figure 6-64, 18 participants (or 45 percent of the respondents) compared to 16 (or 40 percent) of them felt that the information transmission at the airports was updated and accurate and that they could access the internet or web based enquiry services.

In either cases (as shown in figures 6-63 and 6-64), equal numbers at 3 each (or about eight percent in each case) felt that both services were always available. For the first time, a significant number (see figure 6-64), that is 6 passengers (15 percent) expressed no view. They may be due to the fact that that they had no idea of the service, may not have been introduced to the internet, or may not have had available to them gadgets to test the service. This result seems to have impacted on the results in figure 6-64 resulting in the differences accounted for in the other two results of 'never' and 'mostly' as those views were lost. However, on all counts, the results tell a lot about the services at the airports and the views of the majority of the passengers using them.

17- Which statement best characterizes the organizational climate of this airport?

Stable, Dynamic, Volatile, Turbulent

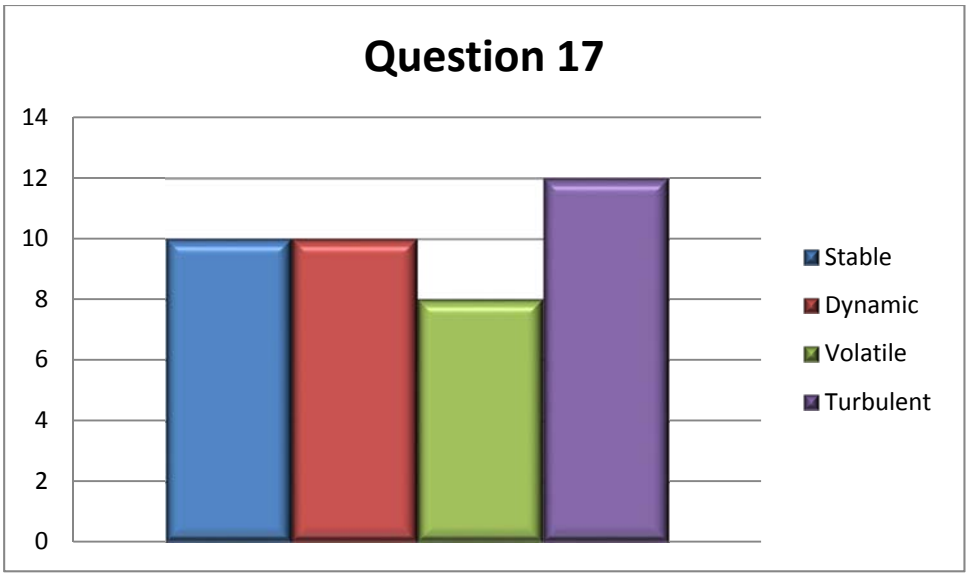

Figure 6-65: The words which best characterize the organizational climate of this airport

In figure 6-65, 20 respondents (50 percent) and 12 respondents (30 percent) observed the organizational climate of the airport as being turbulent to stable. 8 respondents (20 percent), however, saw the system as volatile as in the previous case where they assessed the IT services in the airport. Thus the reliability of their perceptions is affirmed since the facilities for expediting the process.

Size is an issue although judgments which depend on the measurement or the speed of best characterizes organizational climate of this airport may not necessarily be size related, at least in modern times. However, in most cases larger IT systems have been known to have larger memories/processors and, therefore, tend to process data faster thus yielding faster and better service.

Question 18- Are institutional IT priorities tied to this airport's budgetary procedure?

(No or Yes)

Generally, good service provision is mainly dependent on funding and this is determined by the provision made for both the infrastructural base and equipment requirements. Therefore, it was imperative to ascertain the level of commitment in budgetary terms to such provisions. In this respect, respondents were quizzed as to whether institutional IT priorities were tied to budgetary provisions at the respective airports. The outcome is recorded in figure 6-66.

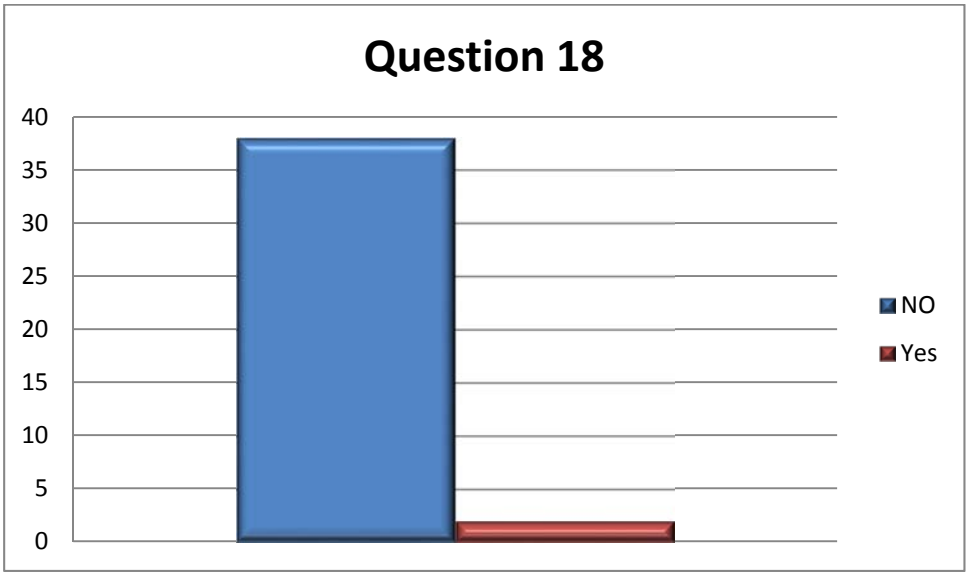

Figure 6-66: Institutional IT priorities tied to this airport's budgetary procedure

As shown in figure 6-66, respondents overwhelmingly replied no to provisions being made in the airport's budgetary provision for institutional IT priorities. This goes a long way to underscoring the institutional policies in respect of the infrastructural provision in this respect. As shown in the figure 6-66, all the respondents answered the questions, out of which 38 respondents (or 95 percent) said that no provision whatsoever was made in the budget as institutional IT priorities were not tied to their airport's budgetary procedures. Notwithstanding, two (or 5 percent) of the respondents stated that this was covered in their respective airports budgets. This finding covers the general perception outlined earlier in the study that IT provision has not been seen as a priority. This said, however, it is not uncommon that such should be the case as air transport at these airports and in these locations is in its infancy, is minimally resourced and the emphasis is rather more on the journey itself. Therefore, ensuring the maintenance of the aircraft and providing training for pilots and other crews takes

precedence over any other auxiliary services, particularly over institutional IT being stressed as a priority.

Question 19- May we contact you to obtain further insights or clarification on your responses?

(No or Yes)

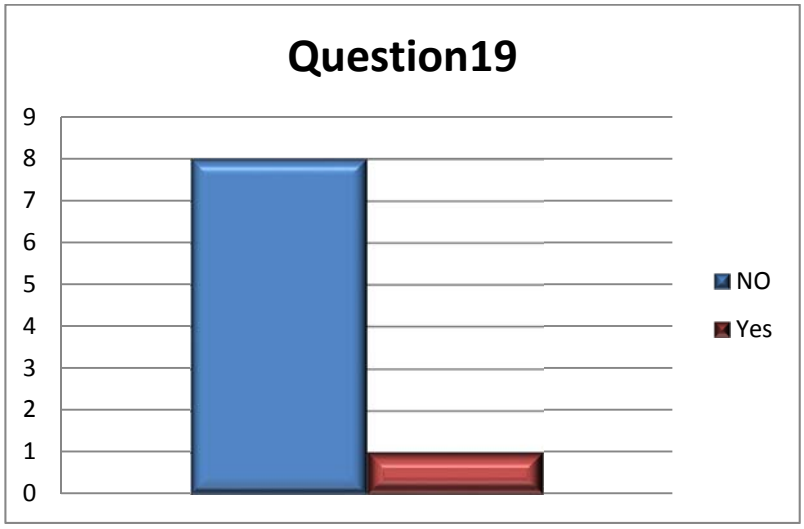

Figure 6-67: Whether the participant was willing to be contacted to obtain further insights

Question 19 enquired about the possible contacting of respondents for further information. As figure 6-67 shows, the majority of respondents declined further follow-up. Of the total of 40 respondents, only 9 answered the question. Out of this number, only 1 (2.5%) showed any interest in offering to give further information or receive feedback on the findings of the study. This may stem from the fear of repercussions from an oppressive regime or merely disinterest in the study or even a wish to avoid the possibly of having to display ignorance on a subject they may feel incompetent in handling.

Question 20- Do you wish to receive a copy of the key findings from this study?

(No or Yes)

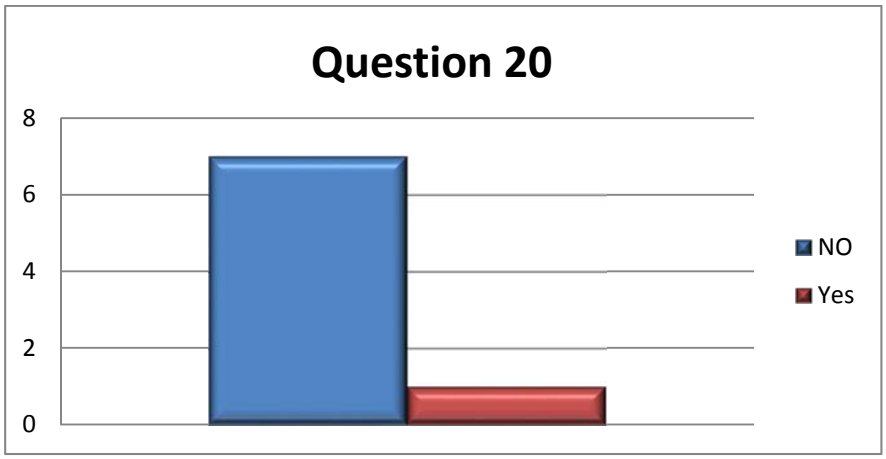

Figure 6-68: Enquiring as to whether the participants wished to receive a copy of the key findings from this study

Question 20 sought to find out about respondents' interest in the study by enquiring about whether they would be interested in the findings that would emerge. As indicated in figure 6-68 (where the responses are similar to the immediately preceding question), quite a significant number of the respondents failed to answer this question. Of the total of 40 respondents, only 8 answered it. Out of this number, only 1 (2.5%) showed an interest in getting feedback on the findings of the study. This could be attributed to several factors, the key one being the political climate at the time which nurtured fear in people as absolute loyalty to the government of the day was required of citizens who would normally want to avoid intrusions into their lives. Also, the respondents were seen to have an older age profile and lacked interest in IT implementation mainly due to its challenges with respect to training and other requirements (with their associated hurdles).

Conclusion

Part of the quantitative study surveyed the passengers using the two Libyan airports to find out their backgrounds in terms of which continent they originated from. This background survey of the respondents suggested that the impact the study could have on African perceptions of IT implementation could be very significant. This was as a result of a high external input (i.e. from participants who originated from outside Africa?) into the study which was seen to be advantageous, as theoretical and empirical evidence suggests that good practice in IT implementation at airports is more advanced in locations outside of Africa. The substandard nature of the service rendered with respect to IT services, as observed by the respondents, suggests that the respondents had been exposed to high standards at airports in developed countries. However, the observation of customers' dissatisfaction with services of this nature being tied to intrinsic value (with respect to the amount of money spent for the service received) was noted as some clients had only one need irrespective of the service, i.e. to get to their destinations safely. The study found some respondents in this category to whom all the details of the IT services had no significance. It was also noted that good service provision is mainly dependent on funding which determines the provision for infrastructure based on the level of commitment in budgetary terms to such provisions. And, as this was found to be limited in several respects, the services could leave much to be desired. Respondents were disinterested in giving more information or in receiving feedback from the study and it has been noted that this is likely to have resulted from the hostile political climate or from sheer disinterest based on the technicality of the subject.

6.2 Qualitative Analyses' Results

There are now available a large number of software packages which can assist with the analysis of qualitative data (Remenyi et al, 2005). For this study, matrix software, which enables the researcher to explore, browse documents, and analyse the content of interview transcripts, was used.

6.3 The Interview Sample and Limitations

For the interviewing stage of this data collection, 12 employees altogether were selected: seven from Tripoli airport and five from Benghazi airport. For the interviews, people of a higher job status were selected. These were employees who are high up in the organisation and who made decisions that affected the running of the airport, for example, decision makers, IT managers, managers, and top level employees. These top level managers were chosen because they have a direct relationship with the airport.

This section reviews the qualitative part of the study based on the findings from the interview data that were collected as described in the methodology adopted for the study, the semi-structured interviews for data collection and the analysis based on the methodology sections as described in chapter 5 (section 5.3.4). As demonstrated in that chapter, 12 respondents from management level within the two Libyan airports were recruited for face-to-face semi-structured interviews, as shown in table 6-49.

It is worthy of note to mention that this method facilitated the comprehension of key factors that can encourage the adoption of up-to-date IT systems at these airports (in order to enhance the services rendered to passengers as well as providing easier means for some of the workers' cumbersome tasks in various processes). In fact, the benefits these facilities could bring to the airports (and the aviation industry as well as to other sectors of the economy like the hospitality and tourism sections) really needs no more emphasis.

In this chapter the interview findings, along with appropriate supporting quotations, are presented to emphasise the relevant points. As an outline, this chapter will, therefore, cover the following: personal profiles (information), international expansion factors, the business environment, regulations and the role of IT and its strategy/implementation, readiness for change and technology improvement.

6.4 Interviewees' Profiles

The background of the interviewees and the airports where they are employed are briefly introduced in this section. During the empirical part of this study, 12 respondents from 2 separate airports were interviewed as they were the key decision-makers within their respective organisations at these airports. The organisations and the airports involved in the study are outlined in table 6-49.

The researcher chooses seven people from Tripoli airport:

- IT Department Manager.
- Financial Department Manager.
- IT Section Chief.
- IT Department Manager.
- IT Assistant Manager.
- The Supervisor of the technical information section.
- IT group leader.

And another five people from Benghazi airport:

- IT Department Manager.
- Assistant Manager.
- ICT Deputy Manager
- IT Head of Staff
- IT Assistant Manager

Job Title (Case)	Organisation	Department	Location
IT Department Manger	Libyan Airways	ICT	Tripoli
IT group leader	Libyan CAA	IT Section	Tripoli
IT Assistant Manager	Benghazi Airport	ICT	Benghazi

Assistant Manager	Assistant Manager	IT Section	Benghazi
IT Department Manager	Benghazi Airport	ICT	Benghazi
IT Department Manager	Tripoli Airport	IT Section	Tripoli
IT Section Chief	ITC Department at Tripoli Airport	Communica-tions Section	Tripoli
Assistant Manager IT	CAA	Communica-tions	Tripoli
Deputy Manager	Libyan Airways	ICT	Benghazi
Financial Department Manger	Financial Department at Tripoli Airport	Financial Department	Tripoli
The Supervisor of the technical information section	The Supervisor of the technical information section Libyan Airways	IT section	Tripoli
IT Head of Staff	Libyan CAA	IT Section	Benghazi

Table 6-49: Profiles of the semi-structured interview respondents

Table 6-49 shows the profile of the respondents alongside their respective airports as places of employment. Also captured from the semi-structure interviews [I assume you do mean from the semi-structured interviews, as I can't see these elements in the table above] are the nature of the daily routines, particularly the IT processes and databases utilised by individual staff and the organisation as a whole.

As part of the profile study of the interviewees, their roles, daily routines and IT responsibilities as well as their management of information were also sourced and analysed. From the interviews it became evident that all the respondents had administrative roles and routinely supervised other employees in their sections. They also handled and managed a lot of data which required the use of information communication technologies (ICT).

It was found that they all had access to computers ranging from laptops to desktops which were either personal, shared or both. The worrying phenomenon, however, was that hard copies of information were stored in general offices and, in most cases, were accessible to other staff or individuals who may not be authorised to access them.

This is what the IT group leader of the Libyan CAA in the IT Section of Tripoli Airport had to say:

> *"Almost every day there is the same routine at work but sometimes we face problems, especially in high season in the summer time, dealing with database and check in systems".*
> *"I store my belongings and the important documents nearby my desk in a safely locked storage cabinet?"*

In most cases, however, responses to the query about where data were stored ranged from '*in the main office*', '*near the main office*' to '*in the manager's office*'. There was a strong interest shown by the respondents in knowing about colleagues who worked with them in their offices and elsewhere in the airport as they all responded affirmatively to wanting to access such information.

6.4.1 Expansion Factors

The need for IT implementation and for improvement in the airports being studied has already been outlined in this thesis in the profile section (section 3.7 and 3.8) and thus it is necessary to assess the factors that would make these feasible. The respondents revealed several factors that would impact on the implementation of IT (where IT was non-existent) and for its improvement after its introduction. These included the following:

The IT Department Manager at Tripoli Airport believed the main effective factors in the implementation of IT in the airport to mainly include:

> *"Employing competent engineers and bringing in international companies to provide new systems and also new technology, and to provide the*

administration of the engineering, planning and the administration of the IT." (IT Department Manager at Tripoli Airport)

The IT Group Leader at Tripoli airport had similar views but additionally saw the need for extra capital input and a considerable significant budgetary provision to be made in this regard. Hence, he replied to the question on the provision of effective factors to implement IT in the airport thus:

'Good budget, experienced IT organisation to share and build up IT, excellent training for our staff and bringing in a new generation for the job; good team work.' (IT group leader at Tripoli Airport)

Concerning the introduction of capital investments at this stage, the responses of the interviewees were analysed specifically to see if there was concern for such factors. It was revealed that in 10 of the interviews the need for more capital investment into the provision of IT systems was emphatically articulated in one form or another and indeed discussions relating to the effective factors in the implementation of IT at these airports yielded comments that justified this fact. In his view, the IT Department Manager at Tripoli Airport thought that the team and the level of education of the people who run the airport needed boosting, all of which depended on the injection of funds. He noted as follows:

"*Training is very important... bring specialized companies and improving the infrastructure and updating the service. The financial resources are very limited so providing more financial sources and young people and manpower investment …yes, providing a good budget and human resources for renovation"* (IT Department Manager at Tripoli Airport).

Another finding in this part of the study was the cultural practices covering both the national and individual level which impacted negatively on the provision and improvement of IT services. In this regard, it was revealed that the organisations concerned lacked any kind of cultural training? and thus invested little or nothing in their employees.

Recruitment at the airports favoured those advanced in age leaving younger people out of the equation. By so doing, the future of the recruitment base of the companies was very threatened as there would be little or no replacement for the retirees; neither would cover be provided for eventualities like fatalities or staffs' abrupt abdication of posts should they occur. Therefore, old and virtually incompetent staff would continually be recycled to fill vacancies. To this end, respondents' calls for training and the inclusion of employees with a younger age profile was welcoming and they were echoed throughout the entire study. The key figures interviewed captured these issues as follows:

> *"The main effective factors to implement IT in the airport are to bring in expert IT companies locally or from outside the country, and the contract should include some airport staff training." (*Assistant Manager IT at Tripoli Airport)

Respondents were also quizzed about the most important issues concerning improvements to the IT systems in their airports and to give any suggestions on what improvements could be made. The IT Department Manager at Tripoli Airport had the following suggestions:

> *"For me the most important, number one factor for improving IT at airports is infrastructure, then prices of IT services, upgrading users, increasing and promoting the work team, the airport administrative routines and security in that order."* (IT department manager at Tripoli airport)

While his counterpart, the IT Department Manager at Benghazi Airport made the following suggestions:

> *"My suggestion for improvements in the airports in Libya is through investment, training, infrastructure, team work and airport security… all of them very important."* (IT Department Manager at Benghazi airport)

In fact, in all cases the responses were similar although the vocabulary differed somewhat. Also, in some instances, the answers were limited which suggested that there were limitations to accessing IT services by some of the respondents. While the IT Senior Manager at Tripoli Airport had suggestions

devoid of any IT expertise (‘*providing financial resources*’, ‘*infrastructures*’ *and* ‘*training*’), his colleague at Benghazi airport, the IT Section Assistant Manager had nothing whatsoever to suggest in respect of such provision and declined to respond. However, rather implying any lack of expertise, this may have other connotations, such as being conscious of his own security in respect of the protection of information and a fear of intimidation from the regime at the time (irrespective of the promise of confidentiality and anonymity throughout the process of this study to all respondents). It is, therefore, necessary to mention at this stage that the political loyalty or otherwise to the regime had a lot of influence on people in all situations. Also, self-confidence and courage also played a role in this, as many people put their safety and security above everything else.

Finally, in this section of the study, respondents had to comment on the key applications that would provide the most impact if they were improved significantly. Here, with the exception of the IT Department Manager, Libyan Airways, at Tripoli airport who mentioned specific applications such as ‘airbus web services and AMASIS’, the rest had general and generic responses ranging from ‘no suggestions’ through simply ‘any’ and ‘any application that will be good for the work is okay’ to more generally ‘the services of the internet’ by the Assistant Manager of IT Communications of the CAA at Tripoli Airport.

Therefore, the shortcomings of the staff in respect to IT systems’ implementation and improvement are laid bare. All the respondents revealed that there is a need to increase the level of IT implementation and improvement through more investments in the sector as well as adequate and appropriate training provision for the manpower that will be given responsibility for these roles. With such improvements, the IT systems at the airports could be seen to serve their clients or passengers better and could help to ease the procedures and processes at these airports.

6.4.2 External Factors

Attracting international expertise, and learning from best practice in comparable sectors, yields meaningful and rewarding results. For this reason, respondents believed it to be appropriate to attract international expertise to these

airports in varying capacities. Such expertise could be used to fill positions that currently lack the requisite knowledge and applications of IT systems for these areas. Managers could also, through these sources, organize training for local staff to quickly fill such gaps. The need to send staff, especially younger ones, to learn such applications overseas in order to bring back knowledge and hands-on experience to help grow the local systems was also emphatically stressed by the interviewees. These factors were acknowledged by respondents as can be seen in the comments noted below:

> *"The effective factors in the implementation of IT in the airport are to employ competent engineers and bring in international companies for new systems and also new technology, and to enhance young team members and the level of education of the people who run the airport."* (IT Group Leader of the Libyan CAA at Tripoli Airport)

> *"Training is very critical, so bring in specialized companies to train more young people to update staff and to improve the work teams, the cultural level and the educational level of the users and the employees."* (IT Assistant Manager at Benghazi Airport)

Furthermore, it was also recognized that bringing in specialist companies (by contracting out certain operations for which expertise could not be sourced locally) was another key factor in addressing the IT systems' problems at both airports. Asked about the key applications that would provide the most impact if they were improved significantly, the allocation of finance to contract out specialized sectors in order to attract requisite skills and advanced technologies to deal with IT problems was well noted. Key comments in this regard were as follows:

> *"The most important issues to implement or/and improve ITS is to fix the infrastructure of the IT system mainly in this airport and in all Libyan airports, actually in the whole aviation industry in Libya, because if the infrastructure of the technology is no good then the whole system will fall down; and then training, good management, and special and expert*

technology from foreign companies." (Assistant Manager IT Section at Benghazi Airport)

"I will say one thing; find the critical points (areas) in the IT system and implement there." (IT Leader in Tripoli Airport)

6.4.3 Business Environment

For successful operations, a harmonious business environment nurtured by collaboration has always been known to be critical. Therefore, the respondents were asked about how they collaborated in their respective workplaces especially with their colleagues and then with their clients. Interestingly, teamwork and attempts to understand the varying cultures and backgrounds of passengers, whose interests would be? as varied as their numbers, were stressed by many of the respondents. These include comments such as:

'If the organisational policy and procedures are not supportive, if there is no IT department or the training and learning system favours only individual effort, it may be difficult to get people to work together and process the knowledge required; it would also be difficult for passengers to know where he is going (not traveling) inside the airport itself because the of lack Information Technology.' (IT Department Manager (ICT) at Tripoli Airport.)

'Collaboration between the departments, even more than between the employees, is important because it can help to transfer the information and knowledge documented in the technology bases to wider knowledge requests in the airports, and even across airports' organizations and departments. KMS is essential to IT as much as to HR'. (Deputy Manager of Libyan Airways, Benghazi Airport)

Respondents noted the need for regularly meeting with colleagues in their own departments as well as with related, and even unrelated, departments to ascertain how best to address issues of concern. Their current modes of communication were stated as relying, in some cases, on moderately advanced technologies like traditional telephone lines but regular personal contact through the use of messengers still persisted. In effect, addressing these needs, and especially dealing with language barriers by using IT applications that incorporated

translation facilities to bridge language barriers, was deemed very appropriate and commendable.

6.4.4 Rules and Regulations

Respondents were also asked to comment on their concerns on rules and regulations that impacted on their various capacities and roles. As noted earlier, an overwhelming majority opted for multi-lingual websites where rules and regulations pertaining to working roles, staff and passenger notices and other concerns could be raised in major languages in order to ease the process of communicating such announcements to the appropriate audiences. The majority of the interviewees cited the prevalence of such practices in comparable organizations like those in the hospitality industry to which airports owe most of their custom (as the majority of tourists and other clients of this industry end up in one airport or another). Therefore, facilitating the modes by which the rules and regulations operating in these areas are transmitted is of utmost importance for the speed, comfort and safety of passengers. Comments in support of these views were put forwar by all the interviewees, notable amnong which were the following:

> *'The rules and regulations inside the airport are theoretically effective, even if it is a shortage and prejudice of employees of the airport , but this is not the only problem which is suffered by the employees and passengers alike; the most common problem is the direct and indirect interference of authorities' managers be they from inside the airport or outside. Some of the managers do not obey or take into account these regulations and laws for staff for example, training on the new systems within the airport and improving the training and the learning of languages, and also to improve the new systems in all departments such as AESO and AISA.'* (IT Assistant Manager (ICT) at Benghazi Airport)

Also, the issue of training features here too as the respondents felt that staff members and passengers who are affected by any such rules and regulations needed to be educated in one form or another in order to communicate to them the import of what results were expected. Such intended outcomes have to be properly articulated to their audience and users so that they are viewed positively without arousing any feelings of suspicion resulting in the erosion of any liberties. Failing this, a backlash may result, the outcome of which may result in total or partial rejection of any such regulations. Therefore, the interviewees were asked

about the modes by which such training took place and an overwhelming majority opted for hands-on, practical and video-based training as being the modes that would make it easier for the recipients to assimilate and adopt any rules (even where it required adjustments being made in lifestyles that could impact on the comfort of individuals). Notable submissions by respondents included the following:

> *"Any kind of training, just let us get training … any, just to improve the employees. Practically… theoretically … and video presentations and videos based on real jobs."* (Deputy Manager of Libyan Airways, Benghazi Airport)

> *"Yes. Any kind. Any kind of training is the most important thing that is beneficial for us and for the passengers. It is difficult at the moment and it needs time, training and bringing in specialists."* (IT Department Manager (ICT) at Tripoli Airport.)

6.4.5 IT Implementation Strategy.

The implementation of IT in the operations of the airports under study has been seen to be paramount. In fact, major airports around the world where successful business has been achieved have recognised this fact. To this end, respondents' views on the barriers that hamper the implementation of IT systems in the airports and any strategy to shore up any improvements were seen to be commendable. Their comments on the barriers to IT strategy implementation, however, yielded varying responses. Significant among them were the following views that gave detailed remarks about a strategic vision of workable solutions to IT systems' implementation difficulties:

> *'The current infrastructures, from a socio-technical viewpoint to ensure systems, are sufficient to meet the needs of the organisations and ITS implantation The systems requirements must allow easy and flexible reconstruction of ITS progress. Also, knowledge resources should be fully exploited for IT activities. The critical issue to be managed here is to do with obtaining a clear picture of strategies relevant to the airports' requirements and establishing and maintaining an operational IT strategy*

and, most of all, there is a need to upgrade the infrastructure of ICT systems' (The Deputy Manager of Libyan Airways)

Again, competence features in the study. It has been the key factor running through the perceptions held by all the respondents with the majority recognising the lack of it at the IT implementation level. Some respondents saw the employment of competent engineers as the solution but failed to suggest a long-term sustainable solution for this problem. It will be recalled that much effort has been spent placing a stress on training as a key solution to this problem and, hence, it may be regarded as needing no further emphasis, yet the need for reducing the age profile of employees does need more stressing:

'New faces (young) and those who have an ambition in creativity are wanted to work within these airports. Furthermore, do not forget training, a effective factor that will upgrade the work to the required level; also to create innovation among employees currently inside the airport; these factors can the process of the strategic implementation of information technology to the fullest'. (IT Assistant Manager of Libyan CAA at Benghazi Airport)

In addition to the above, the benefits of putting in place a strategy for the successful implementation of IT solutions at these airports was again raised by many respondents who saw the opportunity once again to make their points. Notable among them were the IT Assistant Manager ICT at Benghazi Airport and the IT group leader, Libyan CAA, at Tripoli Airport who saw that such strategy would not only make gains in customer satisfaction (and thus attract and expand the client base); it would also save a lot of money and resources especially the time spent in getting operations performed to the desired standards. In almost all cases, there was no indicated that there was a strategic IT plan in place for their respective sections.

6.4.6 Readiness for Change

Notwithstanding that a case has been made for the implementation of IT systems in all the departments at the airports being studied, there still remains

the question as to whether this change is due at the present time. It is not always the case that the availability of monetary and other financial resources would be enough for the adoption of innovation. Therefore, the interviewees were requested to assess the readiness for such a change in its entirety. It is needless to mention that the numerous benefits have been assessed and so have the cultural and training requirements for this change; therefore, it was obvious to expect an affirmation of the readiness of all departments represented through their respective officers participating in this study. Such was the trend of suggestions put forward by the respondents. For example:

> *'A lot of the managers do not like this change first of all and second of all it is difficult to find sufficient money for change or the development of some of the great departments under the Director classical* (old classic system) *and in order to maintain its place in this administration, and to please his top executives (managers) and last but not the last sequence administrative boring'* (Deputy Manager (ICT) at Benghazi Airport)

However, views for a holistic overhaul of the facilities at the airports were expressed by some of the respondents. Although it appeared to be outside the context of this study, the IT Section Chief of the ICT Department at Tripoli airport felt that if change was to come it should not be restricted to IT systems. As far as he was concerned, change should visit every part of the airport. He seemed confused with the whole idea of concentrating on IT systems' implementation and believed that more had to be done in other areas too. In fact, other basic facilities need addressing if IT systems do not function properly. These were the views he held about the whole strategy for IT implementation:

> *'From my point of view it is not IT alone which needs to be developed, most regimes want to renew and develop, for example, the classic (old) administration department, the management of security and safety, routines in financial management as well as routines in the management affairs' personnel, a consideration of the process which leads to delayed departures and, most importantly, crowds in the parking area and passengers' gridlocks.'* (IT group leader Libyan CAA at Tripoli Airport)

6.4.7 Technological Advancement

Technology takes several forms and has implications on training and on cultural change for its adoption. Having assessed the views in respect of such training and the national, societal as well as organisational cultural modifications required to embrace such change, the trends in IT improvements and in the adoption expected, require being assessed. In fact, this part of the study exposed a very low level of IT systems' knowledge and experience among the respondents; however, there was quite a reasonably significant level of IT systems' expertise displayed by some.

In the first group were the Financial Department Manager at Tripoli Airport and the IT Department Manager of Libyan Airways at Benghazi Airport who gave general views in respect of budgetary constraints, personnel expertise and training requirements when asked about the specific technological improvements they envisioned for their departments. These comments are what they both had to say:

> *"… must find a suitable alternative to replace the systems in place inside the airport, for example, improve the existing systems and find solutions for the internal network of the airport."* (Financial Department Manager at Tripoli Airport)

> *"… improve the performance of technocracy by giving them indoor and outdoor courses to improve their career performance and provide an introduction to the best in the field of foreign Information Technology companies based on the availability of funding.' (*IT Department Manager of Libyan Airways at Benghazi Airport)

On the contrary, there was another group which belonged to the second category of respondents who appeared well versed in IT systems' adoption to an appreciable standard. The IT Department Manager of Tripoli Airport and the IT Assistant Manager at Benghazi Airport, for example, saw this study as an opportunity to display their knowledge of IT systems by referring to the specific IT companies and systems they had dealt with. The former stressed the importance of ISP, Spider and Libya IFR Airbus as key technology suppliers to his organisation while the later spared no effort in outlining the significant benefits

that had accrued to his department from IT systems' companies like Libyan WIMAX and local IT companies. **T**he IT Section Chief at Tripoli Airport also cited the same companies. The following were the views of the three IT 'gurus' who showed that it was not 'all gloomy' with respect to the IT systems at the airports but that some level of implementation had already taken place:

> *There is a lack of technical information and a lack of development in systems and information technology, but there are efforts made by computer engineers and some local companies in the development of some of the systems inside the airport, and do not forget the efforts of some airlines in giving us some of the existing systems*.' (Supervisor of the technical information section ICT at Tripoli Airport)

6.4.8 Categorisation of Activities and Projects

Establishing a high level of IT implementation would lead to the automation of several activities, if not all, in order to achieve full benefits from the process. Therefore, in this part of the study, the respondents were assessed for their capabilities and the experience acquired in the performing their various functions with respect to being able to categorise some or all of these. The responses suggested that there is much to be desired in this regard as they themselves appeared dissatisfied with how such a categorisation was done. They seemed very concerned with bureaucracy and their inability and the lack of commitment for innovation. These are some of the comments worth taking note of in this regard:

*'Knowledge resources must be designed based upon knowledge management systems; requirements, and must allow easy and flexible construction of an IT progression. Also, knowledge and technology resources should be fully exploited for IT knowledge activities through human, technology and related tasks (process); that is why we need staff to innovate. Therefore, the organisation should give them what they need in order to do so' (*Head of Staff at Libyan CAA, Benghazi Airport).

6.4.9 Additional Requirements

Pertinent to qualitative studies of this nature, respondents usually feel the need to address issues that have not been raised by the questions asked. Therefore, such an opportunity was granted to the interviewees to lay bare any

other concerns or requirements they might have. Concerns ranging from technological hitches to administrative mistakes and employee incompetence were addressed. While some, such as the IT Section Chief at Tripoli Airport, felt there was little left out (after what had been discussed), others like the IT Department Manager at Benghazi Airport and the IT Department Manager in the Libyan Airways ICT section at Tripoli Airport had a lot of issues to discuss. So did other respondents whose concerns are detailed in the quotations below:

> *'It is the main task of senior management to communicate the organisation's goals and strategies for ITS to all employees in a clear vision in order to obtain full support from them for the success of the IT activities.'* (IT Section Chief, ICT Department at Tripoli Airport)

> *'… but we have some requirements that should be there to finish the job so it is as good as the organisation wants it to be. There should be no between the top managers and their staff. Top managers should be fair to all their staff. Sometimes big issues arise (such as staff working overtime and not receiving payment, or updated/new equipment is only presented to the staff who are close to the top managers).* (IT Assistant Manager, LCAA, Benghazi Airport).

And, at this stage ,the IT Department Manager at Benghazi Airport raised a very important issue:

> *'We should look at the critical areas to implement our IT systems in this airport'*

This way, he believed, meant that much needed capital (which is always scarce, hence, the need for drawing scales of preference) could be applied appropriately. Although, Libya is renowned for its resources, it is always the case that the much needed application of capital to the required sectors is often hampered in one way or another as a result of the scarcity of resources.

Conclusion

An assessment of the readiness for change in its entirety has been stressed. Although it is probably needless to reiterate, yet it is worth noting that the numerous benefits that IT implementation will bring to these airports cannot be quantified in respect of any investment. To this end, the cultural and training requirements for such an implementation are obvious in order to facilitate an affirmation of the readiness of all departments for such a transformation. Hence, the old and virtually incompetent staff that have been continually recycled to fill vacancies would need to give way to younger and more educated staff who will be more ready for such an IT transformation. It is, therefore, necessary to mention that political loyalty (or otherwise to any regime) has no place in the recruitment and selection of competent staff. Therefore, the shortcomings of staff in respect to IT systems' implementation and improvement that has been laid bare in this study need to be addressed from every quarter using as many resources as possible which should be optimally applied.

Chapter 7

The Conceptual Framework

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7.1 Introduction

Technological Knowledge must be applied in order 'to have value' within a specific business context. Its application may have to be undertaken differently depending on the industry concerned. Most of the studies that form the basis of

existing frameworks have been carried out in organisations in western countries where there can be similarities in some of the assumptions made about the components of a conceptual framework. In order to add a new perspective, this study has been conducted in a developing country (Libya) and investigates the differences in the culture (the culture are different from one country to other sometimes the dissimilar even in one country from south to west or from north to the east) and the infrastructure provision at a local level, thus providing a non-western, and developing, country perspective.

This chapter addresses the development of this conceptual framework and provides a review of the theory, research and practices of IT that contributed towards building the framework. The framework explains how to bridge the gap between the desired situation for successful ITS (Information Technology Strategy implementation) in Libyan airports and the current situation. Entitled the (Information Technology Implementation Framework for Libyan Airports) (ITIFLA), this model is useful in helping the airports to identify their deficiencies in this area and, subsequently, to remedy these. Two versions of this framework were investigated. The first version – the pre-field work investigations' framework' - was based on a number of theories and assumptions derived from the literature and the preliminary, secondary research and group sessions (the workshop investigation for validity). The second version – the post-field work investigations framework' - is a modified framework based on the results from the empirical investigations (questionnaires and interviews) that were conducted in order to develop the final draft of the framework. The development of the ITIFLA is described in detail in this chapter. The description of the development of the ITIFLA is organised in the following order: Sections one and five present the introduction and conclusion respectively. Section two provides the requirements for the framework. Section three describes the ITIFLA. Section four explains how to read the ITIFLA and Section Five discusses in detail the ITIFLA development.

7.2 Requirements

If Organisational Technology is regarded as a strategic asset, then the method selected to implement an ITS is critical (Bollinger and Smith, 2001).

Understanding this Rubenstein-Montano et al. (2001) made some recommendations which are:

- Methods should be based on frameworks. For instance Wiig *et al*. (1997), in their methodology, explicitly discussed the idea of an overseeing framework which incorporates the elements: review, conceptualise, reflect and act.

- A framework provides a set of guiding principles for a discipline and a methodology can be thought of as a specific, detailed description of how to carry out the ideas and objectives set forth by a framework.

- The method should contain sufficient detail to be implementable. Thus, the framework should be presented and described in detail in order to be comprehensible.

In the following section, this study will introduce the requirements of a framework that would increase the likelihood of a successful ITS implementation within Libyan airports, and which will give staff within airports in general, and within Tripoli and Benghazi airports in particular, the ability to determine the airport's organisational readiness for the implementation of IT. The requirements should provide the foundation for developing a balanced measurement which aims to present current organisational status and the expected status in terms of a successful implementation of IT systems, by identifying a suitable framework for such an IT initiative. In this context, this framework builds an approach to ITI (Information Technology Implementation) that is specifically tailored to the organisation's environment, processes and goals.

This research first derived general elements for effective IT implementation through a comprehensive literature review. Then, considering the elements within airports during the preliminary research, this research analysed the status of the selected airports through secondary research and, finally, it discusses the lessons and implications for IT initiatives using the framework presented in this chapter. In order to produce such a framework, a suitable structure is established built upon the activities that have been conducted so far in this study that have identified the key ITS components required in order to achieve successful implementation within airports. These components have to be extracted,

combined and/or modified accordingly; their generic characteristics should be considered essential in designing IT activities and presenting a refined framework for ITS implementation. The structure embraces the main components of ITS implementation (see Figure 7.1). This structure led to the development of a measurement model that is able to measure the organisational status of readiness for IT implementation in terms of (Critical Technology Implementation Areas) (CTIAs).

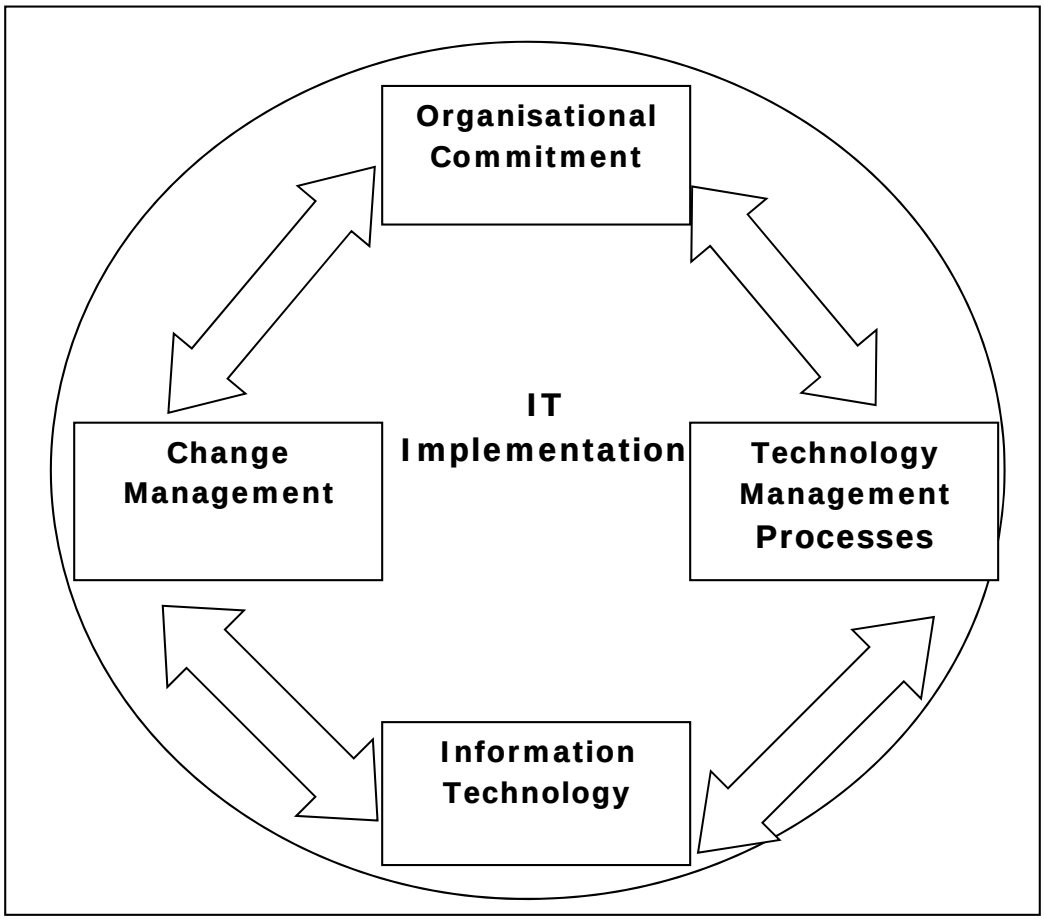


Figure 7.1: Domains of Readiness

Depending upon the nature and characteristics of the tasks that Depending upon the nature and characteristics of the tasks that different organisations pursue, the main focus of IT implementation may be different and thus, accordingly, the core characteristics (see 1.3.2 in chapter one) of the airports must be considered in order to recognise the main points upon which IT implementation should focus. Thus, a sound Information Technology Implementation for Airports (Information Technology Implementation for Libyan

Airports) (ITIFLA) specifically developed for the selected airports is expected to help to fulfil this need by providing important guiding principles and directions. However, developing such a framework can be a challenging task for managers and practitioners as they may lack knowledge of what technological characteristics, areas and constructs should be included within it. Implementation frameworks that do not consider all the necessary areas that should be covered can provide an incomplete picture of IT and its implementation processes, thus providing sub-optimal guidance. The ITIFLA (having been developed specifically to assist Libyan airports in understanding the range of IT options, applications and technologies available to them) provides a overview of the totality and complexity of the various IT theories, tools and techniques presented in this research. Additionally, it provides a framework within which management can assess its ITS focus and can establish and communicate its strategic IT direction. Thus, general ITS phases are presented within the framework, along with detailed steps on how to carry out the ITS expected outputs. These steps are: initiate, diagnose, establish, activate and learn.

7.3 A Description of the Framework

The objectives of this research were focused on providing the two Libyan airports with a practical methodology which could be used to translate the conceptual ideas of ITS into a working programme with defined objectives, or deliverables, using terminology that the organisations could readily understand. The research highlighted the requirement to develop a supporting analytical methodology to examine employee actions and behaviour with regard as to how they can effectively process technology and information. This would have the benefit of identifying the key areas in existing IT initiatives as IT is still a developing field in Libya and there exist a number of distinctive IT frameworks, each of which is different in focus, scope, components and approaches.

Information technology plans should identify the strategic ITS areas that can achieve the desired technological goals. It is argued that IT has to be viewed strategically. According to the research's findings, Libyan airports are expected to encounter difficulties in implementing and communicating IT initiatives if IT is not considered to be of strategic importance within the airports. The case analysis of the Libyan airports has investigated/ addressed critical areas and the readiness of the airports for IT implementation. This can be depicted by the use of a model

that explains particular requirements in terms of four domains, each of which is classified into four or five critical implementation areas (see Figure 7.2)

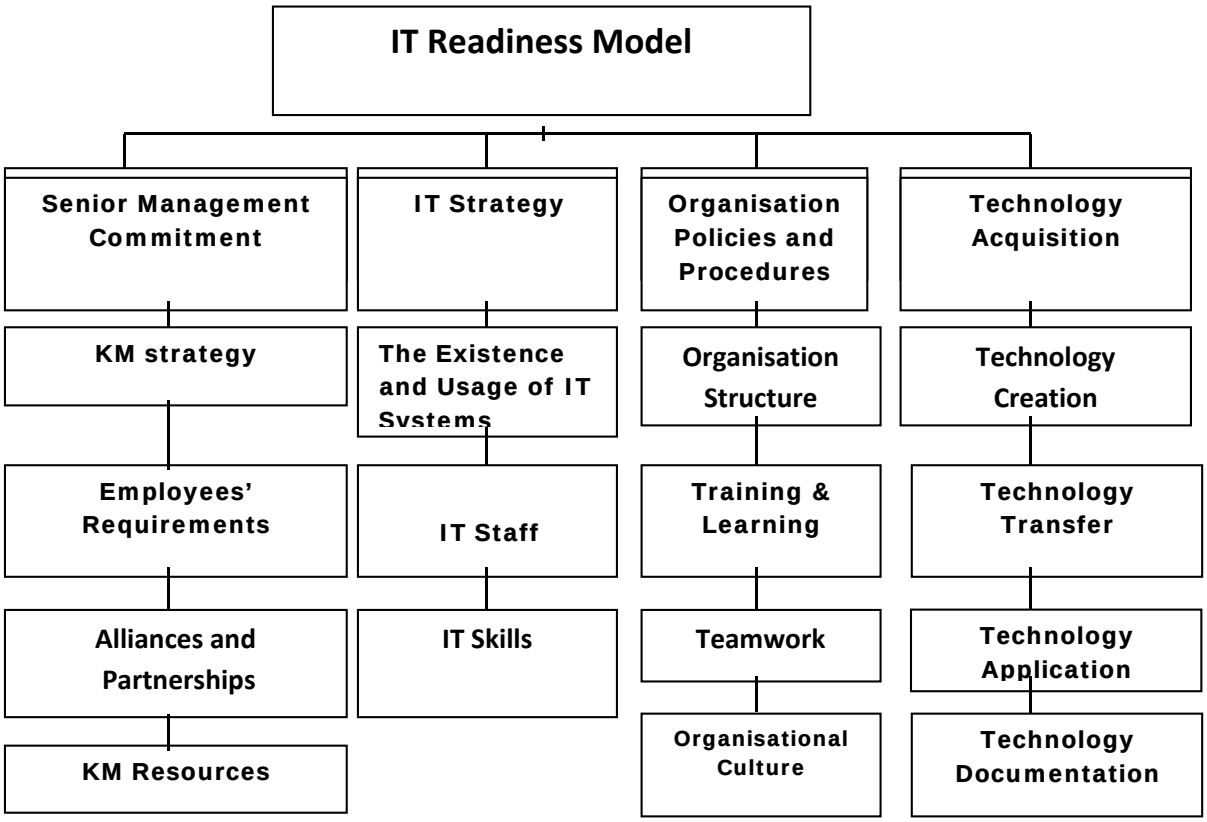
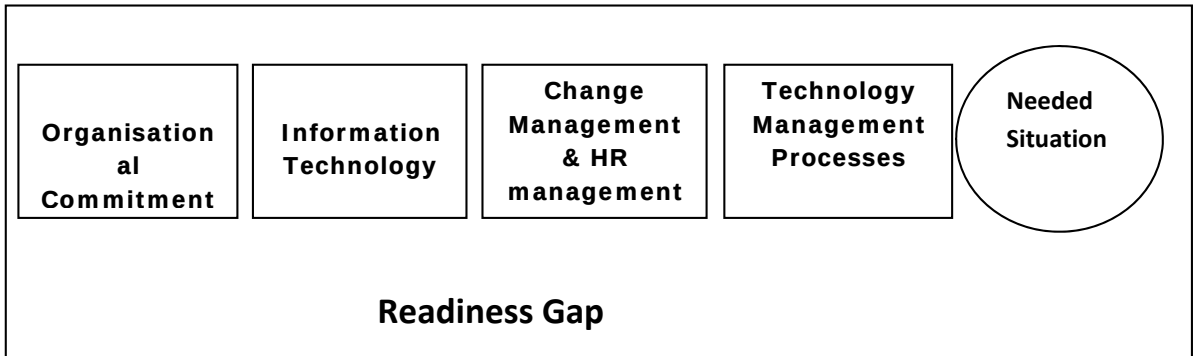


Figure 7.2: Structure of the Readiness Model

Applying these four domains in the ITIFLA to both individuals and the organisation (as well as applying the four means of developing technology within the airports) means that the gaps between the importance of the critical areas and their state of readiness can be established, as depicted in Figure 7.3.



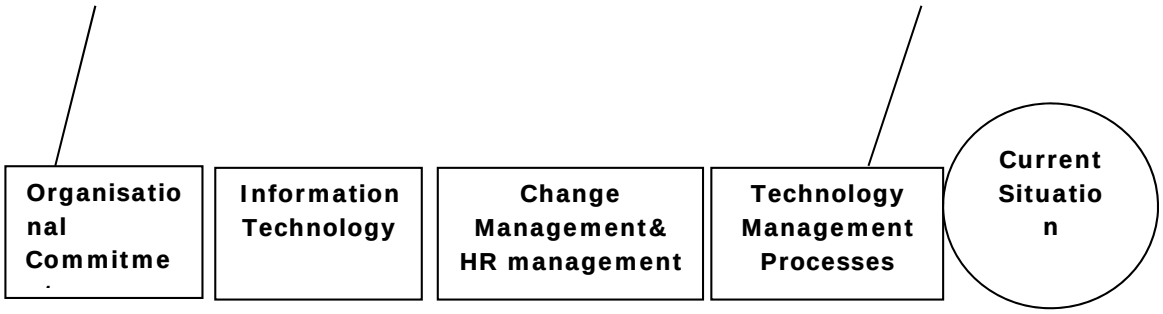


Figure 7.3: The Readiness Gap

The following section describes the domains (OC Organisational Commitments, CM Change Management, IT Information Technology and TMP Technology Management Processes) in detail, using a description of the attributes associated with each of them as they might occur in each of the five maturity levels**.** Each of the (Critical Technology Implementation Areas) (CTIAs) describes an attribute that forms part of an aspect of how the status of the particular attributes should be at different organisational ITS maturity levels.

The levels described in the framework do not intend to make a judgment statement on the status of the organisational maturity. Some of the descriptions of the attributes at the early levels might be understood to have a negative connotation but this is not, necessarily, the case. The framework is merely trying to describe (depending on accumulated experiences and previous frameworks introduced in the literature which were reviewed earlier (Chapter 2) the status of an organisation's ITS implementation maturity at each of those levels.

7.3.1 The Five Steps in the Framework

Each of the five fields in the matrix represents a key area for developing technological capabilities. While developing each field on its own is expected to result in greater organisational technological capabilities, each one relies substantially on all the other fields. To achieve large and substantial gains in capabilities all four fields must be addressed and developed on an ongoing basis.

The proposed requirements for a ITS form crucial areas for the design of an ITS and provide the building blocks for integrating organisational commitment, CM, IT and IT processes. In doing so, a number of issues arise. These need to be

addressed when implementing an ITS and they are explained in detail in the following five Steps.

Step 1: Initiating a Technology Management System Plan

The aim of Step 1 is to provide support by the overall organisation as well as by the senior management in order to ensure that an interest in IT exists, and that the effort to further implement IT will be pushed forwards. Senior management solely has overall responsibility for the different Steps of the process and thus must lead the airports to a more global approach towards IT.

An IT strategy is also needed to facilitate the transformation of the various types of technology within an organisation and to provide an evaluation mechanism to measure the effectiveness and efficiency of any strategy. Users' support (employees) is also needed. This can be accomplished by involving users in the development process of IT. Furthermore, the aim of Step 1 is to provide a structure for formulating a strategic business plan for the ITS by identifying the external (business) drivers, defining strategic objectives or goals, identifying critical success factors, and developing measures to analyse the technology dimension of the problem. Figure 7.4 presents a version of the template for developing an ITS plan.

Step 1: Initiating

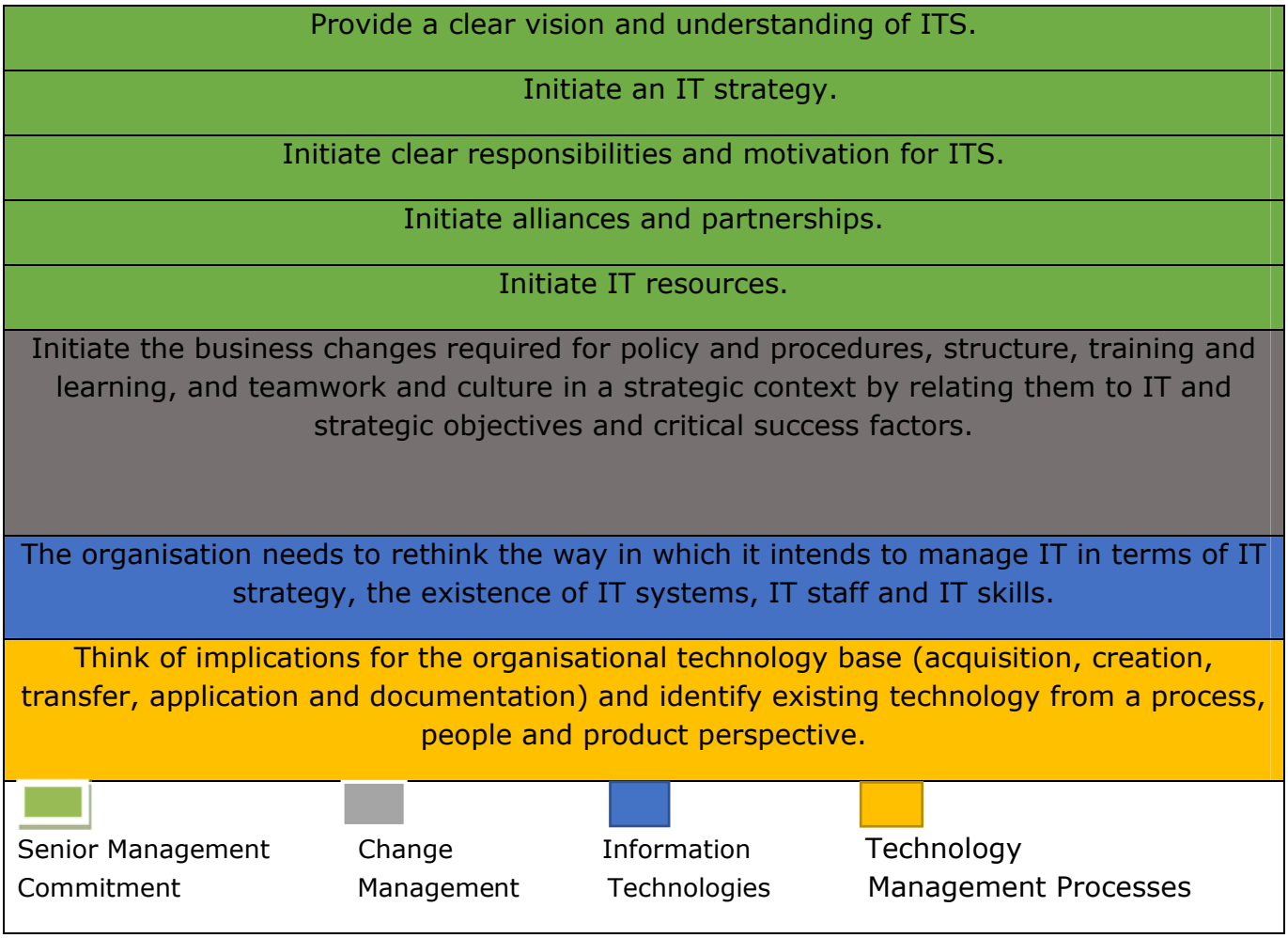


Figure 7.4: Step 1: Initiating the ITS plan

These CTIAs are the key issues within ITS implementation that influence the airports' ability to achieve or cope with radical future changes. The outcome of Step 1 is a business improvement plan for ITS implementation with performance targets.

Step 2: Diagnosing ITS Infrastructures

The diagnosing Step (Step 2) builds upon the initiating Step in order to develop a more complete understanding of the improvement work required.

During the diagnosing phase, two characteristics of an organisation are developed: the current state of the organisation and the desired future state. These organisational states are used to develop an approach for improving business practice. The goal "scanning the airports' overall environment" is to provide an integrated and organisation-wide capability to develop a successful ITS implementation.

The primary goal was to collect, analyse and interpret information from various sources. While this was directed initially towards the needs of senior management, the results from the environmental scanning initiative were of importance to other steps. As this scanning function developed, it was important to ensure that the processes and systems for implementing IT were considered holistically. Moreover, links between the findings within the area of this research and other findings in the literature had to be encapsulated. The aim of Step 2 was to clarify whether the business problem had a technology dimension and to develop specific IT initiatives to address the business problem. Figure 7.5 shows the steps involved in identifying the technology implications of a business strategy and for developing IT initiatives for business improvement. IT mechanisms can only be managed successfully if there is a mutual consensus to forge long-term partnerships and to establish centralised IT processes.

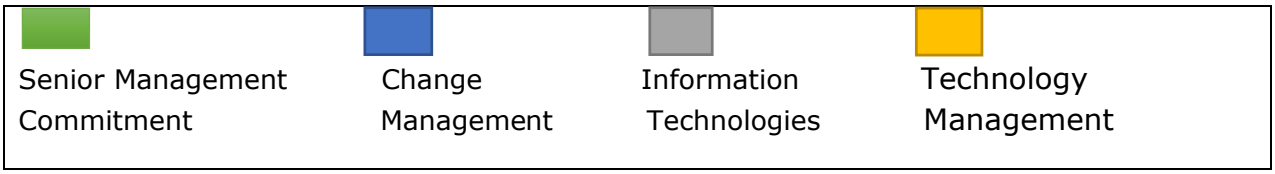
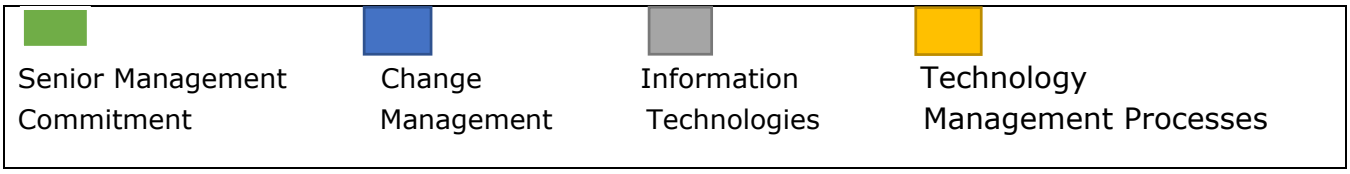


Figure 7.5: Step 2: Diagnosing the Technology Management System Infrastructure

The outcome of Step 2 is an IT strategic plan with a set of initiatives and implementation tools to support business improvement.

Step 3: Establishing IT Infrastructures

The aim of Step 3 is to provide a structured approach for implementing the IT initiatives. Figure 7.6 illustrates the main activities in this step.



Step 2: Diagnosing
Monitoring and reviewing the state of the ITS vision and interest.
Step 3: Establishing
A long term IT plan is established, is closely aligned with the organisation's strategic and business plans and the organisation's corporate strategy and shapes the organisation's technology culture.
Appointing a Technology Chief Executive to be champion for the IT project.
New programmes are introduced, as appropriate, to improve employee satisfaction and to assess staff and reward them for developing new technology and testing new ideas.
Starting partnerships and collaboration which will help the organisation to learn from others and to transfer technology to their organisation's technology base.
Re-allocating all the resources needed for the IT programmes based on priorities that reflect the results achieved.
Establishing the IT policy and procedures and the technology standards and cycles; also building IT guidelines for specific operational areas.
Developing the structure of an IT department with responsibility for IT strategy and business.
Initiating a strong sense of teamwork across the organisation and linking incentives, rewards and recognition with the teams' contributions.
Initiating an ITS which supports cultural shift and a technology-smart workforce and environment. The organisation should plan to exploit a co-operation culture for improving its position, capabilities and expertise.
Establishing an IT strategy for the whole of the organisation.
Establishing strategic IT applications' services and networks with internal and external entities to provide communication services for all individuals and groups in the organisation, and putting plans in place for providing diverse hardware architecture according to each unit's needs.
Appointing a high level manager for the IT services' area with middle management status.
Initiating core technical skills and outsourcing some expertise in order to plan the strategic exploitation of IT for individual units and the organisation as a whole.
Initiating IT acquisition activities such as collecting any information needed and clients' (passengers') requirements; being active in an external professional network or

Figure 7.6: Step 3: Establishing Technology Management System Infrastructures

association; conducting research (i.e. with universities) to explore future opportunities/possibilities.
Initiating IT creation activities such as openly discussing problems and failures within the airports. New ideas and insights could lead, if necessary, to the redesigning of business processes and work methods.
Initiating IT application activities (such as decision-making) depends on sufficient technology, on ensuring that technology, products and services receive explicit attention on using existing know-how in a creative manner for new applications, on frequently making use of brainstorming sessions to find solutions for problems, and on ensuring that failures and successes are evaluated and that 'lessons learned' are set down.
Initiating IT documentation activities such as having up-to-date handbooks which should be frequently used, having documented all the specific Information Technology skills of individual staff, and having up-to-date technology documentation systems.

In terms of ITS implementation, Pan and Scarbrough (1998) reported that management and leadership play a critical role in establishing the multi-level context needed for the effective assimilation of IT practices. There is a need to have the necessary infrastructure in place together with adequate resources; for instance, implementing an IT infrastructure in terms of establishing physical connectivity between people is a very important task. The infrastructure issue affects all businesses. Today's environment forces organisations to obtain all or part of their overall infrastructures such as IT, training and learning, TW, culture etc.

The outcome of Step 3 is an IT strategy and an implementation plan with priorities together with an appreciation of the likely impact of various IT initiatives. This step is the most challenging, as a justification of IT initiatives depends on the expected establishment of IT infrastructures. The outcome of Steps 1, 2 and 3 of the ITIFLA is a business improvement strategy underpinned by IT.

Step 4: Activating IT Infrastructures

The activities of the activating step help the airports implement the work that has been conceptualised and planned in the previous three steps. These activities will typically consume more time and more resources than all of the other steps combined. As the adoption of the ITS grows organically, the management should promote the ITS to their staff in order to try to persuade them to use the IT systems and tools. Management should ensure that prospective users are

educated and trained to use the ITS effectively and that the staff are given plenty of opportunities and are encouraged to learn and use the IT system.

The outcome of this step is a specific business context that creates values and draws on people with diverse expertise and technological skills in order to enhance the existing value chains as well as to create new ones. The pace of change in the business environment in the activating step means that strategic plans can no longer be set for a fixed term and then implemented, but must continually evolve in response to management's growing understanding of the organisation in the context of its environment (see Figure 7.7).

Step 4: Activating
Involving senior management in the whole IT process and implementing through business efficiency in order to support IT objectives and goals.
Reviewing the IT strategies that are commonly used by senior managers in order to ensure input into strategic and business planning.
Checking that the formal mechanisms are in place to survey employees' encouragement and satisfaction regarding IT on a regular basis and that the results are tracked over time. IT initiatives are linked to employees' satisfaction; hence employees are rewarded according to their technological skills.
External and internal resources are provided to all managers and employees; resource planning models are used to estimate resource requirements need for the IT.
Integrating organisational policies and procedures within IT activity practices.
Preparing an Action Plan and identifying the changes required in the organisation's structure.
Managers apply training and learning in their day-to-day operations of IT and seek to upgrade the quality of training; they also seek to provide all the key IT training and learning in terms.
The organisation starts to create teamwork and a culture that will support IT initiatives and corporate goals.

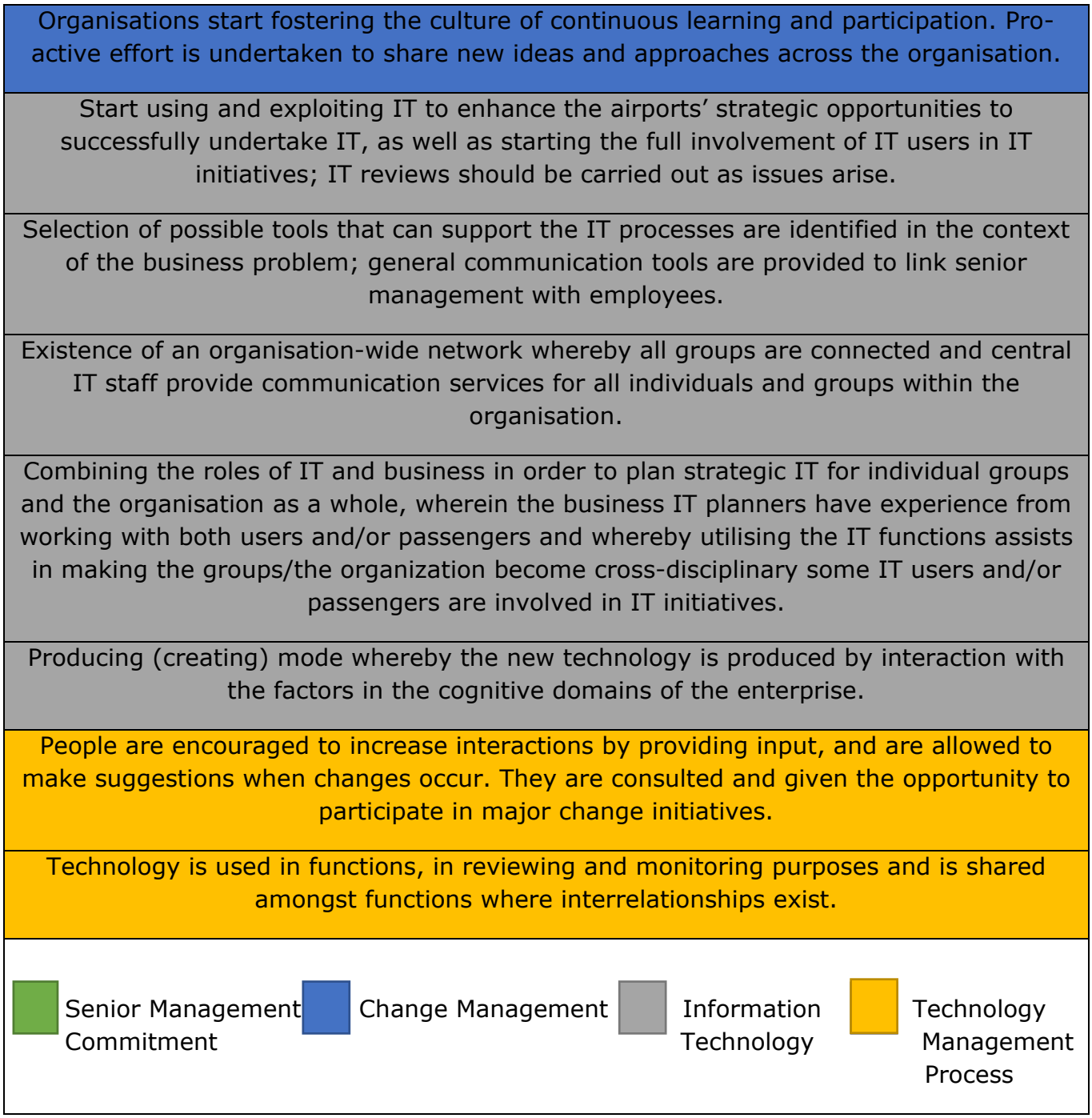


Figure 7.7: Step4: Activating in Technology Management System Infrastructures

Step 5: Learning Technology Management Activities

The learning phase completes the improvement cycle. One of the goals of the ITIFLA is to continuously improve the ability to implement change. In the learning step, the entire ITIFLA experience is reviewed to determine what was accomplished, whether the effort achieved the intended goals, and how the organisation can implement change more effectively and/or efficiently in the future.

The outcome of this phase is a strong OL (Organizational Learning) climate. Senior management need to take the initiative to gain sponsorship and support for the efforts in this direction. However, due to the diverse backgrounds of the employees, senior management should not assume that cross-functional thinking will happen overnight, particularly in organisations traditionally characterised by functional isolation, domain dissimilarities and centralised management. One action that managers can undertake is to facilitate learning and the acquisition of new technology as needed or desired.

Learning in organisations takes place when experiential awareness traverses across departmental boundaries and results in leveraging strategically valuable technology to improve goods and services. With respect to this, Francis and Mazany (1996) concluded that, to become a learning organisation, an organisation must develop a wide range of technology, skills and characteristics. However, the first step is to develop the necessary structures to assist with these factors within the organisation, as well as for the organisation itself, in order to learn and to change (see Figure 7.8).

Step 5: Learning
Value of an ITS in the organisation is measured and tracked over time.
Improvements are created in order to develop strategies to address high priority issues relating to ITS. A strong link exists between incentives, rewards, recognition and teams' contribution.
Incentives, rewards, and recognition systems are constantly being improved and customised to suit the needs of the organisation.
The organisation essentially benefits from partnering in supporting its resources to support IT processes and, therefore, requires its larger partners in international organisations to show flexibility and adopt formats to accommodate the organisation's IT policies.
The resources' allocation culture supports openness and flexibility.
The results of the ITS are integrated into organisational policies, procedures and practices.
The structure of the IT department has fully developed IT responsibility for strategy and business.

The organisation truly exploits training and learning for its IT activities.
A strong sense of teamwork exists across the organisation.
The organisation embraces innovation and responsible technology-undertakings. Furthermore, the IT outcomes are used to support innovation, learning and continuous improvement.
The organisation is in a position to benefit from the IT culture that has been developed, to maintain IT on the top management's agenda and to obtain further support from foreign IT companies if it is necessary.
The organisation appears to be using and exploiting IT for strategic opportunities and can successfully apply IT. Additionally, the organisation's IT systems rely heavily on gathering and processing external data in addition to internal data through the use of EDI (Electronic Data Interchange) systems with external entities such as customers, government and suppliers, which can then introduce problems of compatibility between external and internal data.
Existence of an organisation-wide network wherein all groups are connected and the central IT staff provides communication. The 'full involvement of IT users in IT initiatives' communication is very smooth, with management controlling (and not limiting) information on employees/services to all the individuals and groups in the organisation.
High levels of IT skills in all departments. Partial commitment to RTD (Research and Technical (or Technological) Development) initiatives may slow down the rate of progress of IT in the organisation.
Teams in the organisation regularly exchange technological information/skills and reach conclusive decisions relating to major change.
Information flows freely within functional areas and is shared between functional areas internally and externally. People are able to speak out and participate in discussions.
The organisation fosters a culture of continuous learning and participation. Pro-active effort is made to share new ideas and approaches across the organisation.
People are empowered to take responsibility for IT and are encouraged to be innovative by using technology when needed.
The organisation regularly documents technological information and retrieves it when needed.
Senior Management Commitment / Change Management / Information Technology / Technology Management Process

Figure 7.8: Step 5: Learning ITS Activities.

Any IT approach is always an ongoing communicative learning process that enables the periodic revision of corporate strategies in the light of the current business environment (Masini and Vasquez, 2003; Millet and Randles, 1986; Schwartz, 1996; van der Heijden et al., 2002). Therefore, organisations which adopt ITS have to carry on all IT activities and increase interaction between their infrastructures as well as having a long-term understanding of IT planning in order to plan for new concepts.

7.4 How to Read the Framework

The success or failure of an organisation's ITS implementation rests heavily on the organisation's ability to manage and combine organisational commitment, CM, IT and IT processes. An organisation and its managers have to use a variety of approaches to combine, sort and process technology in order to produce timely and relevant technology for forming, monitoring, evaluating and modifying organisational goals and objectives. This should reach a high integration level in order for strategic ITS to be obtained. The airports are required to follow the Five Steps in the Capability Maturity Model format, wherein they cannot move to the next step unless the first one is completed. Each step and its components are interconnected and build upon each other.

The outcomes from the first step are securing Senior Management Commitment (SMC) and support, and the development of a business strategy for ITS implementation with a clear organisational vision and an understanding of IT. In the second step the outcome is a model of the current technology infrastructure, through a reflection which involves an analysis of strong and weak points and determining where opportunities for improvements to the technology infrastructure lie, so a record of the current status of the CITIAs will be available.

The outcome from the third step is that the organisation and senior management establish and implement a technology infrastructure and support system that enhances and facilitates technology processes (acquisition, creation, transfer, application and documentation) at the appropriate levels.

The activating step consists of the actual consolidation, integration, development and distribution of technology. The outcome from the activating step is the actual implementation of a new technology infrastructure. The fourth step of the IT process cycle is a review of the results of actions taken, using assessment

criteria. These criteria should consider whether the infrastructure contains the right technology, whether the technology infrastructure is stable or susceptible to change, whether it is in a form that permits easy use, and whether the people who need the technology can easily access it.

In step five (learning), the organisation is expected to have gained experience before conceptualisation can occur. It can be suggested that the IT process cycle is actually a reflection of the cycle of OL. Kolb's (1976) experiential learning model, whereby technology is created through the transformation of experience, can also be applied to organisations.

7.5 Evaluation and Justification of the Framework

The most appropriate approach that could have been used to test and validate the ITIFLA would have been through its implementation within Libyan airports in order to gather further tangible evidence (Yin, 2011). Such an implementation was an aim that was initially explored during the field investigations. Although this situation did not permit the implementation of the framework in a real life context, as mentioned earlier, other initiatives which could be relevant and necessary to the validation have been considered. This approach to validation consisted of introducing the framework at a specific workshop such IT workshops have also been utilised by (McAdam and Reid, 2001) and to airports that have already implemented an ITS.

In order to tackle the different elements of the preliminary conceptual framework, an agenda for the workshop (with a number of staff from the studied organisations) was developed as a pre-fieldwork investigation. This workshop was conducted to assess and refine the initial concept and to provide ideas for the detailed development of the ITIFLA. The conceptual framework was developed through the literature review, through preliminary and secondary research, and through the three group sessions.

7.5.1 Pre-Field Investigation

The first step in the process of the framework validation was undertaken in the airports as the intended future adopters. Copies of the framework were first

submitted to IT and non IT top managers in Libyan airports (they are particularly selected because there are not too many specialties in IT and high educated personal) in order to tackle the different elements of the preliminary conceptual framework. Most of the participants were familiar with IT and business improvement issues and were invited to the workshop. There were six participants including two directors of IT, one senior R&D manager Official, one accountant from the managerial level, one HR manager and one IT operations manager. Over three-quarters of the participants had a high level of awareness of IT (83.3% of the workshop attendees) and some had awareness of business improvement issues (66.7% of the workshop attendees). This was an evaluation workshop aimed at assessing the robustness of the framework that has been evolved in order to check it appropriateness, readability and comprehensiveness.

The workshop was divided into two sessions. In session one (the discussion session) the participants were organised into three teams of two people (the senior manager's team, the IT manager's team, and the HR manager's team) with the research team members acting as workshop facilitators (the researcher and the assistant). Each team already had a copy of the framework alongside supporting diagrams and guidelines (figures). A discussion was started and each team had to discuss issues relating to their areas of expertise.

In session two a presentation highlighting the importance of the ITS was given to all the teams and a set of questions (see Appendix 06) was distributed to the participants relating to each step of the ITIFLA process and how these steps could affect the implementation of the ITS within the selected airports. The results of both the preliminary and secondary research were presented and then the framework was introduced. Thereafter, a debate took place among the participants and points raised by the participants were recorded. The answers to the set of questions were also collected.

The information from the two sessions was then analysed. Specific questions were asked of the participants concerning the concept of ITS and the possibilities of its implementation within the airport organizations. The recorded questions were classified into six categories relating to the five stages in the framework and to the steps taken as a whole (the logic of the steps and their components).

The six categories of questions are as follows:

-Overall Stages.

-Step 1 initiating.

-Step 2 diagnosing.

-Step 3 establishing.

-Step 4 activating.

-Step 5 learning.

7.5.2 Findings and Feedback

The results based on the analysis of the evaluation questions answered by the workshop participants are shown in Figures 7.9 to 7.14. The questions used a rating scale from 1 (strongly disagree) to 5 (strongly agree). The detailed evaluation of each stage is explained in the next sections.

Overall Stages

The overall approach of the ITIFLA had a high rating in terms of the framework's capabilities to implement a ITS within the Libyan CAA generally and within Libyan airports in particular (see Figure 7.9).

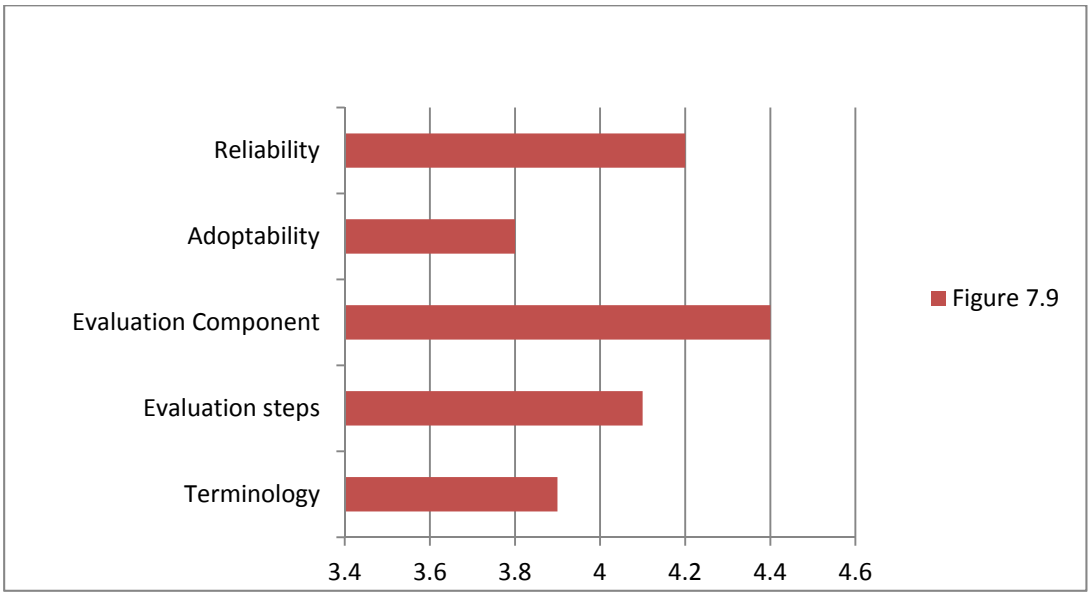


Figure 7.9: Average Ratings of the Key Components of the Overall Framework

The elements in this category consisted of terminology, evaluation steps, evaluation components, adoptability and reliability. The terminology accompanying the framework was considered helpful in the evaluation process but there were some concerns in this respect and it was suggested that simplifying or refining some definitions could assist as some of the terms used could mean different things to different people/organisations. The adoptability aspect of the ITIFLA framework had a high rating, as had the Steps and the components used within it (see Figure 7.9). The framework's reliability was also found to be useful, although it was rated slightly lower than the other elements.

Step 1 - Initiating

Figure 7.10 presents the areas considered to be effective in Step 1.

Step 1 explores the linking of IT to strategic goals and objectives, the strategic context, and business changes and their implications for the organisational technology base. Figure 7.10 provides a summary of the average ratings for Step 1 of the framework.

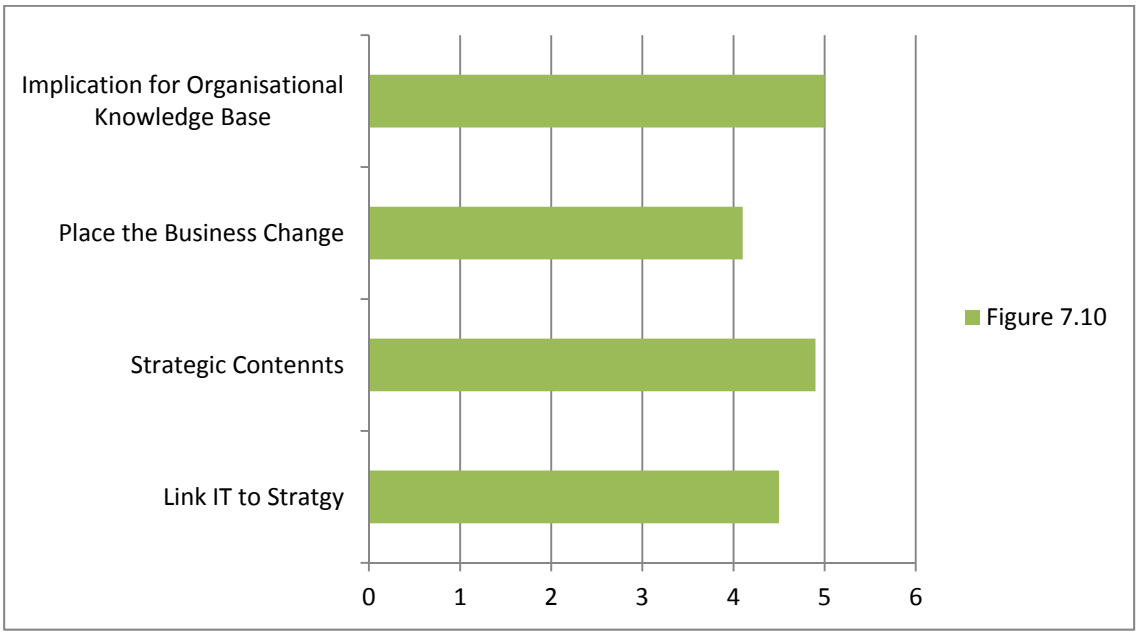


Figure 7.10: Average Ratings of the Key Components in Step 1

All the participants strongly agreed that the framework allows an organisation to be able to implement its IT activities (acquisition, creation, transfer, application and documentation). They also strongly agreed that an ITS should occupy a strategic context within the airports. The need to align the strategic objectives of an organisation to ITS implementation, and to be able to relate CTIAs to the IT strategy were also found to be useful aspects of the framework, as the ratings for both these are high. The place of the business changes aspect encapsulating the different types of IT activities was also considered to be important, although the average rating of 4.2 is not as high as for the other elements.

Step 2 - Diagnosing

Figure 24 presents the average ratings for the key aspects of Step 2 of the framework. Four areas were assessed in this step which were monitoring IT strategy, the level of organisational readiness, the determination of IT tools, and the IT clarification process.

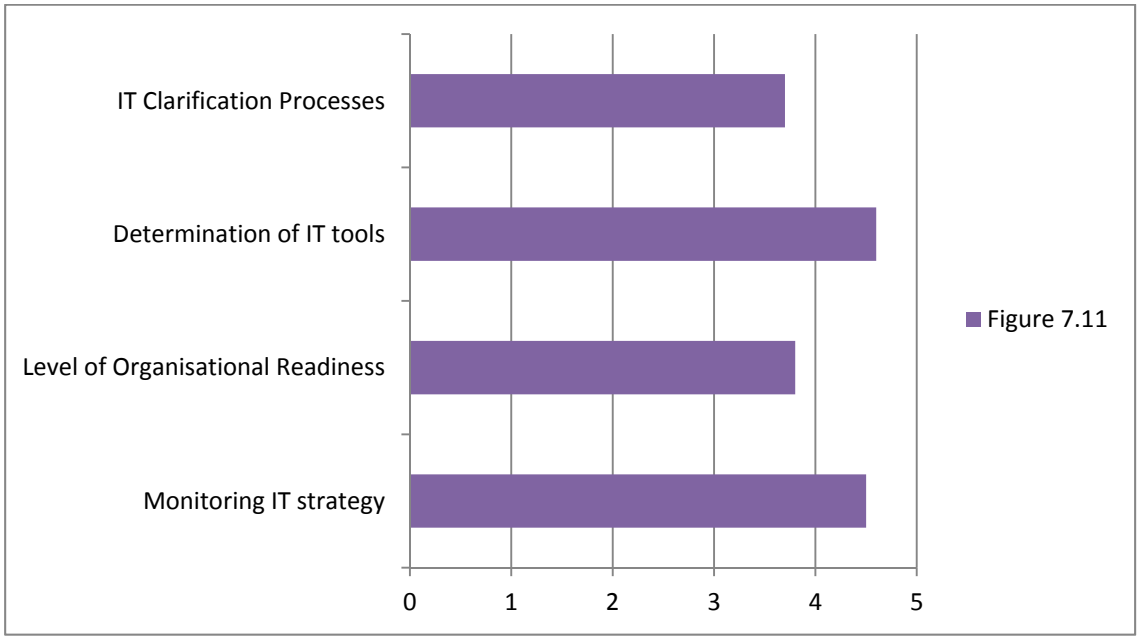


Figure 7.11: Average Ratings of the Key Components in Step 2

An appropriate IT context should be developed and its readiness assessed against the reforms needed. Additionally, as agreed by almost all the participants,

the resources' and results' monitoring mechanism should be in place prior to the implementation of IT. Another key issue on which the participants agreed was the level of organisational readiness to implement ITS. This is relevant regardless of the enthusiasm and resources directed towards improving IT activities. The participants also agreed that the accompanying CTIAs' checklist was useful in identifying the barriers to, and the facilitators for, ITS. One participant commented that the framework was a *'useful thought process to go through, well focused and easy to use'.* Other participants noted that the framework also provides a link with the external environment (alliances and partnerships) of organisations and that it is a suitable framework for a general ITS implementation. The ITS clarification process was found to be useful.

Step 3 - Establishing

Figure 7.12 presents the ratings for the key aspects of Step 3 of the framework. The main areas of this step are identification of the ITS plan, links between IT and CM, IT impact on the ITS, and the implications of IT processes.

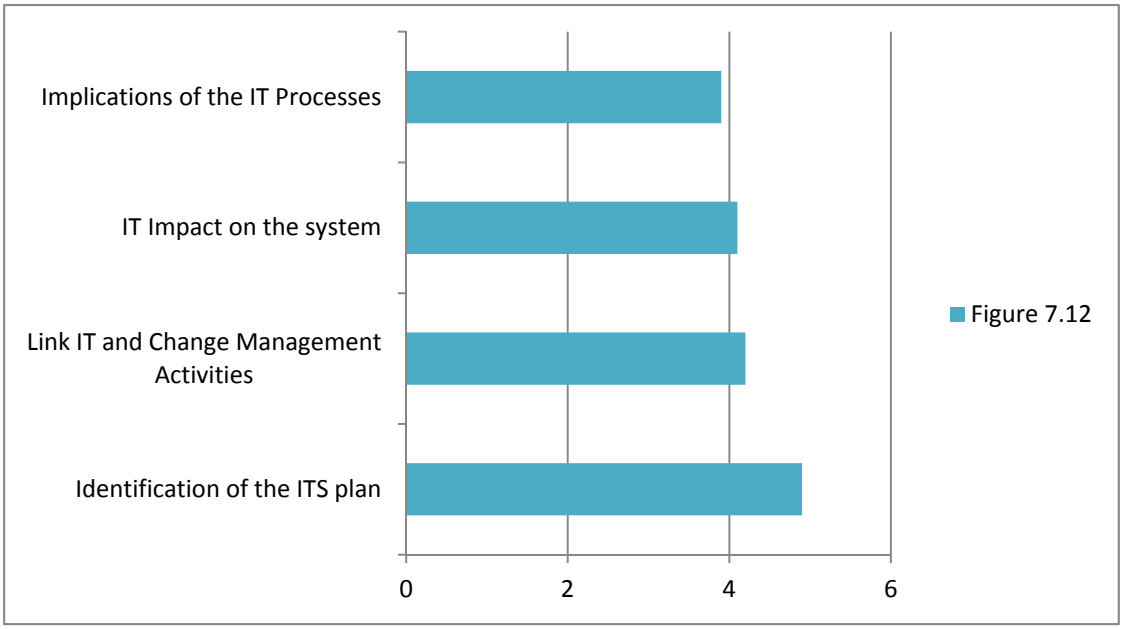


Figure 7.12: Average Ratings of the Key Components in Step 3.

All the participants agreed that establishing an IT plan is necessary in order to develop specific IT initiatives to address the CTIAs. The outcome of this step is an IT strategic plan with a set of initiatives and implementation tools to support business improvement. Also, the Changing Management (CM) drivers

(organisational policy, procedures, structures, training and learning, Teamwork (TW) and cultural forces) are the key issues which influence the implementation of ITS. IT technologies are required for the implementation of initiatives and a range of IT systems can be selected including both hardware and software. The hardware tools comprise the platform required to support an organisation's IT strategy, while the software tools vary from simple databases and groupware to intelligent decision support systems such as expert systems and business intelligence tools. Additionally, it is important to develop IT initiatives that can improve the speed of technological reliability and adoptability in organisations. However, the participants indicated that, as there is a move away from simple tasks to organisation-wide systemic problems, IT initiatives should become more and more complex and effective.

Step 4 –Activating

Figure 7.13 presents the ratings for the key aspects of Step 4 of the framework. The activities expected from this step are providing formal mechanisms for ITS, integrated IT initiatives in business processes, exploiting IT tools and technologies, and increasing interactions amongst staff.

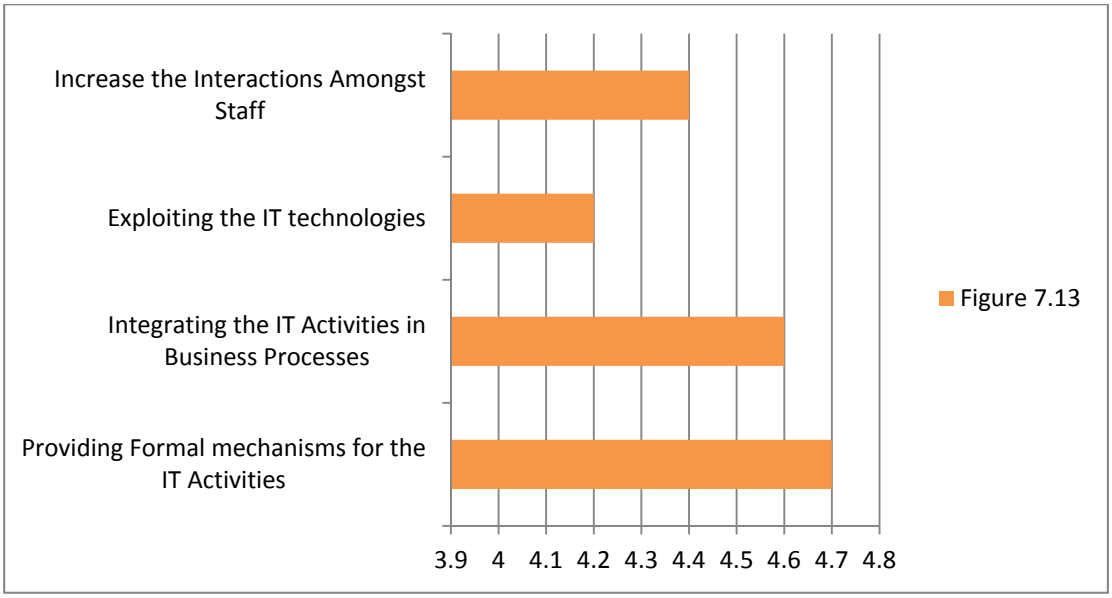


Figure 7.13: Average Ratings of the Key Components in Step 4

The participants recommended that IT needed to be actionable by managers. The IT framework of reference needs to provide guidance for managers to act on. Implementation of the IT infrastructure in terms of establishing physical

connectivity between people requires funding which makes it expensive. Therefore, if the IT infrastructure is not conducive to IT implementation, another step manager can undertake the management of it in order to create an environment, systems and internal processes that facilitate the creation and transfer of technology.

Step 5 - Learning

Figure 7.14 presents the average ratings for the key aspects of Step 5 of the framework. Four areas were evaluated in this step which were constant improvements in IT infrastructure, embracing innovations through ITS results, benefiting from IT technologies and tools, and constant learning.

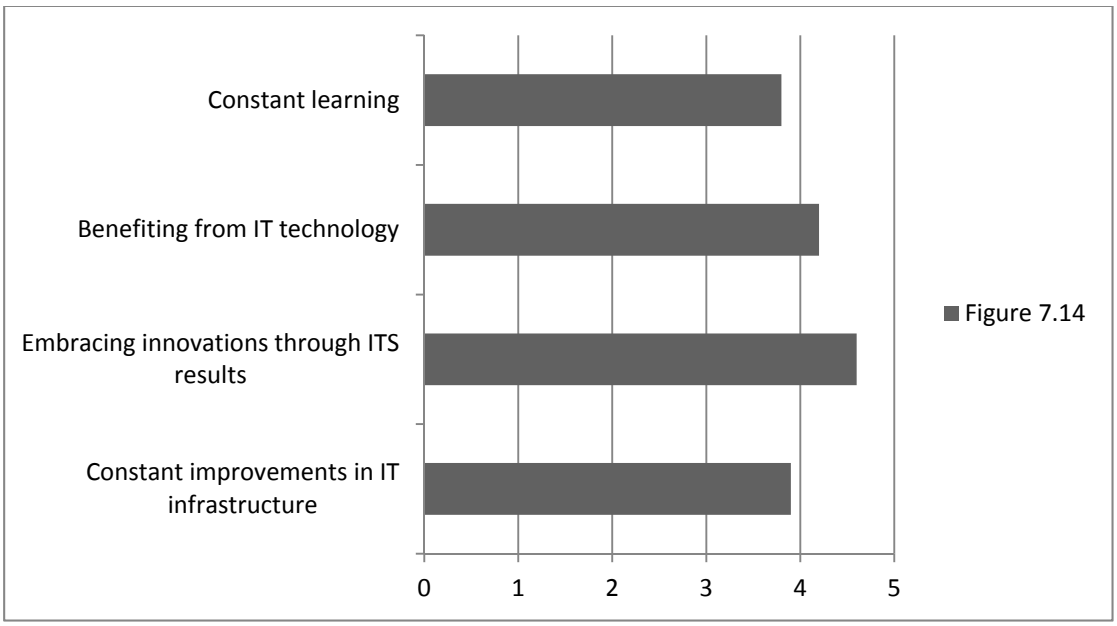


Figure 7.14: Average Ratings of the Key Components in Step 5

To maximise creative ideas, an open technology creation process is required, through which there can be voluntary experimentation with various

methods and the results actively exchanged. Interaction is the key in managing technology, innovation and co-operation and in ensuring that teamwork thrives in a strong, positive, supportive culture.

7.5.3 Pre-Field Investigation Summary

Average ratings of slightly over four (4.34) show that participants agreed that the framework may facilitate the implementation of an ITS and that it can also provide a road map that leads to an ability to realise the benefits of an ITS. However, the evaluation guide to help identify the most suitable techniques to perform IT initiatives, received some criticism and the participants felt that there should be an evaluation point after each step in order to monitor the progress towards achieving the strategic objectives and to identify the IT processes that are related to each step.

Although the workshop was based on a small number of participants, those taking part acknowledged that the framework could be more easily implemented in organisations encompassing immature processes and low interaction (I mean the processes are not up to standing and the interaction was poor (not up to standing) from the participants and even more from international business community because of the situation of the country at that time and still up to now) with the international business community. It was also acknowledged that it is an integrated ITS framework and can comprehend both internal and external elements in order to create, develop and exploit technology.

The next stage of this research involves refining the ITIFLA further, and developing an automated version to facilitate the implementation of IT strategies, and integrating this into an existing business context.

7.5.4 Post-Field Investigation

All the recommendations made at the evaluation workshop have been addressed for presentation in the next stage (interviews). The framework, therefore, provides a solid basis for developing IT strategies that are not only comprehensible but also consistent with the overall strategic objectives of the ITS. The second step in the validation process was relatively more difficult than the first one, because it involves a comparison method to establish what the ITIFLA suggests and current status. The aims of this stage were to:

- Assess the validity of the CTIAs;
- Verify the relevance of the ITIFLA stages;
- Adjust the ITIFLA Framework.

The interviews with the Information communication Technology (ICT) system that had already experienced IT field were limited to two, one with an IT manager, and the other with communication manger. It was assumed that these organisations were good committed to managing technology and that they had achieved benefits from it. Libyan Arab Airlines (LAA) a large airways company operating in Libya one of two largest airlines company, was chosen as an experienced organisation in ICTS implementation. The next section explains the findings and feedback obtained from the interview

7.5.5 Critical IT Implementation Areas Verification.

Most of the frameworks and methodologies mentioned in the literature review (Chapter 2) contained items which are categorised as CTIAs associated with ITS implementation.

In addition to the literature review other ideas obtained from the preliminary and secondary research exercises, and the focus groups, can be conceptualised, to form the basis for the conceptual framework (Sekaran, 2000). In order to gather further tangible evidence (Yin, 2009) to support these CTIAs (variables) and as a solution to the problem encountered in the literature review regarding the adoption of ITS, it was necessary at this stage to verify what are the CTIAs within organisations that have not much experienced ITS implementation as a validation step in the ITIFLA.

The main question to be asked at this stage was:

Are the critical ITS implementation areas that are indicated in the ITIFLA able to contribute to the successful implementation of IT initiatives within your company?

The answers to this question are obtained and further combined with previous results in this research to obtain a full verification of the CTIAs, as follows:

Verification of Organisational Commitments

both interviewees in the Libyan Arab Airlines company stated that in order to establish a business strategy, a clear vision and achievable goals, senior managers have to be the main drivers for ITS implementation, since they are the only force that can persuade a diverse group of employees to focus their collective effort on the process of IT, and they are the only people who can provide employees with a clear picture and guidelines. In this aspect, it was said that:

> *'It is the main task of IT senior management to communicate the organisation's goals and strategies of ITS to all employees in a clear vision to obtain full support and generosity from them for the success of IT activities'*

In these interviews, the importance of IS strategy in term of ITS implementation was stressed, with one person saying that:

'Critical Technology to be managed here is to do with obtaining a clear picture of strategically relevant CTIAs requirements and establishing and maintaining an operational IT strategy'

Rules and motivating activities for ITS stimulation were also confirmed as important by the interviewees, who indicated that motivation systems must be designed and operated considering employees' requirements to get the full benefit and to enhance the process of technology across the organisations. The interviewees all agreed that IT and IS resources include internal and external technology. In this respect the IT manager said:

> *'Technology resources must be designed based upon IT management systems requirements, and must allow easy and flexible reconstruction of IT progress. Also, IS resources should be fully exploited for IT activities throughout human, technology, and related tasks (process)'*

Therefore, to verify the importance of organisational commitment, all the results obtained from these investigations- in the preliminary research, in group sessions indicate the importance of SMC, IT strategy, motivation systems, alliances and partnerships; as well as IT resources. In terms of SMC, top managers

are expected to take hold of the value of the organisation's ITS. Finally, the results revel that IT resources are an effective element in ITS implementation.

Verification of Change Management (CM)

In terms of CM, it was clearly expressed by participants that the successful implementation of IT requires changes in the organisational policy, procedures, structure, and the way in which training and learning tasks are carried out; that new types of staff skills should be deployed (e.g. Information Technology Technician ITT); and that the relationship between top management and employees has to be improved. It was said that:

> *'If the organisational policy and procedures are not supportive, if there is no IT department or the training and learning system favours only individual effort, it may be difficult to get people to work together and process the information system required'.*

Reviewing the relevant organisational experiences it can be concluded that CM programmes were one of the main primary concerns in terms of ITS implementation. For example, the importance of organisational policy and procedures is stressed in the literature review (see Chapter 2), the same applies to organisational structure, the importance of training and learning activities, teamwork and organisation culture.

Verification of Information Technology

From the perspective of IT in ITS implementation, most of the interviewees expressed that the relationship between technology and ITS implementation was very strong, particularly where the organisation worked globally with wide geographical coverage. It was also said that:

> *'IT is important because it can help to transfer information and technology documented in the IT bases to wider technology requests in the ICT industry, and even across national boundaries. IT is essential to a ITS as much as IS'*

ITS should be connected with IT systems. A variety of IT systems could be considered, depending on the characteristics of the organisation, and diverse IT staff should be appointed to fully exploit the IT systems that have been installed,

and to keep these systems well maintained. Also it is indicated that the skills of IT staff and behaviours of employees provide the bulk of the added value in technology processes. IS has little value unless it is complemented by effective skills and behaviours on the part of those using it.

These statements were echoed in the workshop regarding the positive correlation between successful ITS implementation and the effective use of IT. The literature also widely acknowledge the positive role of ITS, and the importance of IT strategy, IT staff, and IT skills.

Verification of Technology Management Processes

In terms of processing and managing technology, it was noted that identifying the IT processes associated with the business problem was an important step in codifying a ITS implementation. The interviewees expressed that the Technology Management and IT process is a major tool in the leveraging of organisational technology. Furthermore, from the participants' point of view, the IT process requires the full and continuous support of senior managers as well as of employees.

All the study stages confirmed the importance of the IT process the results from the preliminary research. This was also acknowledging at the workshop conducted to validate the framework. In this respect, IT processes and other CTIAs are complimentary issues and have to be linked.

7.5.6 Verification of the Framework's Stages

The main question at this point related to the verification of the stages of the ITIFLA, was:

> *Can the ITIFLA stages facilitate the successful implementation of IT initiatives within the Libyan airports?*

The answers to this question were collated; and the views and ideas of the interviewees were incorporated to verify each of the ITIFLA stages as follows.

Verification of Initiating Stage

It was commented during the interviews with the practitioners at the ICT industry that the outcome of stage one should form the base for a clear vision and

acceptance by all senior management, as well as the employees to perform IT activities. These activities can be measured by the full involvement of the senior management in implementing ITS for the whole processes; as well as by the motivation provided by the top management, since top management has the power to effect changes. In stage one, the organisation should get engaged in gathering/ acquiring technology based on the experiences of its employees. In this stage also, the airports should embark on developing a business plan for ITS implementation.

Verification of Diagnosing Stage

The interviewees showed interest in the outcome of stage two, as it would provide a strategic plan for IT implementation with a set of initiatives and implementation tools to support business improvement. It was said that:

> *'Step 2 involves reflective observation, in which the organisation analyses the current infrastructure from a socio-technical viewpoint to ensure systems are sufficient to meet the needs of the organisations and ITS implementation'*

At this stage IT initiatives should be planned as systematic goal-directed efforts for addressing an IT problem in order to achieve business improvement. The interviewees stated that at the evaluation point, the reliability of the strategic plan for the IT infrastructure can be assessed, because it is also vital to assess an organisation's readiness before an IT strategy is implemented. At this point either an internal or external assessor can be involved.

Verification of Establishing Stage

IT strategy and an implementation plan for the establishing of IT infrastructures are very important in terms of IT activities. The set of IT initiatives identified in step 1 and 2 should be aligned with the IT strategy. However, IT tools are required in this stage for implementing suitable IT initiatives. A range of tools

can be selected including both IT-based (hardware and software) and non-IT-based systems (Human activities: face-to-face meeting, training). It was expressed that:

> *'In the establishing stage, the framework should be engaged in establishments to determine appropriate IT infrastructure'.*

In this stage an appropriate IT context should be developed and established to reduce the readiness gap, and furthermore to conduct any reform needed, and provide any resources required. In terms of the evaluation stage it could be that measuring the interaction between the IT infrastructures and the people is very important in this stage in order to monitor the effectiveness of each CITIA as they should be in place prior to the implementation of ITS.

Verification of the Activating Stage

The outcome of this stage is a specific business context values, and draws on people with diverse expertise and IT system both to enhance the existing benefits of IT, and to create new ones. In this stage also, employees must filter the information they hold, so they do not become overloaded, and put what they know on the IT systems and tools. Moreover, in this stage, there should be a combination of the two different perspectives of ITS and technology process. Furthermore, the social aspects of most IT processes are captured by including the involved actors and their roles. In this understanding, and regarding this stage it has been said that:

> *'Stage 4 involves active experimentation, where Critical Information Technology Implementation Areas plans are implemented for the IT infrastructure'*

The senior managers' primary focus in this stage should be activating within a culture that respects of technology, reinforces its sharing, retains its people, and builds loyalty to the organisation. People performance measurements can be used to evaluate the outcome of this stage as people will start activating and exchange technology and they should have clear experiences in this stage.

Verification of the Learning Stage

The interviewees agreed that in the fifth stage, the process of IT activities should be cycled, since learning occurs as a continual loop. Moreover, they indicated that in this last step, ITS tools for each of the technology requirement should be supported, and interaction should be evident since this is the key in managing IT. Furthermore, they felt that innovation, co-operation, and teamwork grow in a strong, positive, supportive culture. It is often necessary to build organisation-wide technology infrastructure (IT) to support IT solutions.

The outcome of this step is expected to be a strong organisation learning (OL) climate; and IT senior management needs to take the initiative for sponsorship and support of the efforts in this direction. However, due to the diverse background of the employees, IT senior management should not assume that cross-functional thinking happens without mentoring and review, especially in organisations such Libyan airports that are characterised by functional isolation, domain dissimilarities and centralised management.

7.6 Chapter Summary

It is still generally unclear how organisations initiate and implement IT projects and exactly how IT initiatives can be applied or contribute to business growth and developments. The current lack of both a well-defined view of the subject and empirical insights have motivated this study to investigate IT-related issues in the Aviation industry in general and in Libyan airports in particular. This study focuses on how some of ITS in general and the most critical IT areas can facilitate the implementation of IT initiatives, and helps the Libyan Airports to realise the importance of IT initiatives and identify any performance gaps and/ or opportunities for its implementation. This empirical study also presents an opportunity to gain a better understanding of challenges to overcome in implementing successful IT initiatives.

Although Gupta and Lyer (2001) state that organisations must apply IT related processes and concepts to capture, transfer, archive and retrieve Technology, many organisations simply did not know how to apply IT because the theory covers a broad range of concepts that describe how organisations should create, share and store valuable Technology in its numerous formats. This research covered some of the gaps in academic research between the conceptual

frameworks of processes that must be undertaken for IT and their practical implementation within the Libyan airports.

This chapter has described the process and analysis which have been employed in the development of the ITIFLA (objective six), which is intended to improve the Aviation industry strategic capabilities relative to IT processes and implementation. Since the dynamic aspect of IT processes depends largely on individual and organisational commitment, IT systems, skills and behaviours, these areas have been included specifically in order to build a high degree of responsiveness, and a willingness to continually re-examine the technology processes.

The chapter further described the approach through which the ITIFLA was validated (objective seven). This validation was based on two phases, a workshop followed by discussion with the potential adopters and professionals who already have a ITS in place. The following and final chapter- 'Conclusion'- provides a summary of the research. It focuses on showing how the results of the study relate to the original research questions and the objectives set out in this thesis. In this regard, the chapter discusses two main points;

1. The contribution of the research in terms of setting CTIAs within Libyan airports and setting up a strategy for implementing an ITS, and

2. Recommendations for future work in this area.

Chapter 8

Conclusions & Recommendations

8.1 Conclusions

This study aimed to establish the key factors that will encourage the Libyan government through the Libyan CAA to expand their activities to upgrade Libyan airports' technology in general and airports' IT departments in particular. A number of objectives were formulated in order to achieve this aim and an explanation was put forward as to how case study organisations were chosen to represent Libyan airports as a whole.

The most appropriate methodology was selected in order to maximise the quality of the research findings and to achieve the overall research aim and objectives, and in order to answer the stipulated research questions. Because of the nature of the research undertaken, the interpretivism paradigm and the qualitative & quantitative approaches were adopted for this study (Sections 5.2.3 and 5.3.3 provide the argument for this approach). Therefore, as justified in Section 4.3.2, the case study approach was decided upon as the best strategy for this research, and in-depth semi-structured questionnaires and interviews were conducted as the appropriate method for collecting the required data, as justified in Sections 5.2.2 and 5.3.2.

Analysis and discussion of the collected data were undertaken in order to investigate and interpret the respondents' answers and to identify and obtain an

in-depth understanding of the key factors that encourage IT departments to expand their activities into airports and, in particular, into IT implementation. The process of data collection was undertaken by two methods.

A- Questionnaires (Section 6.1) and B- Interviews (Section 6.2)

A- Questionnaires gathered data that were collected in two parts. The first gathering of data were collected from the (case study organisations') employees having medium and low levels of responsibility working within the two biggest airports in Libya. The second part was the data gathered via the completed questionnaires which were collected from passengers. This questionnaire was utilised to increase the validity of the research findings because the analysis of the responses to the questionnaire was conducted systematically ensuring consideration of all pieces of information.

B- The information received from the responses in the interviews was the data that were collected from the case study organisations. This data were amassed in matrices, representing a process that increased even more the validity of the research findings because the analysis was conducted systematically ensuring the consideration of all pieces of information. Moreover, the matrices simplified the analysis process in terms of currently and how to improving the response of the case study organisations.

This study consists of eight chapters. Following the introductory chapter, there a literature review is presented in Chapter 2. This was undertaken in order to determine the current state of research in the area under review and to explore within the literature the background to Information Technology relating to IT implementation strategies' expansion. In chapter 3, general background information on the Libyan business environment is provided and the main aspects of the Libyan government's policy towards IT implementation are discussed and evaluated. Chapter 4 considers the methodology and the procedures adopted to conduct this study. It deals with the philosophy encompassed in this study which is based on interpretivism philosophy, and identifies the research approach and the research strategy. Chapter 5 presents the data collection method. Chapter 6 presents the data generation and analyses and goes on to provide the results of the data analysis. It identifies the key factors that would encourage the selected airports to expand their activities into Libyan airports. It also identifies the benefits

that Libya will obtain from the involvement of these selected airports within the country. Chapter 7 consists of the conceptual framework. Chapter 8 provides the conclusions drawn by the researcher in the light of the research aim and objectives, and then presents the suggested recommendations which have been deduced from the study. Finally, in Chapter 8, the contribution of this study to the body of knowledge, and the potential for future work in the area, is presented.

8.2 Achieving the Aims and Objectives of the Research

The main research questions (Section 1.5) have been answered and thus the aim of this research (which was to develop an Information Technology Implementation Strategy for Libyan Airports) has been achieved.

This aim has been accomplished effectively through the following research objectives, which were also fulfilled.

The first objective of this research was "To build up contextual knowledge of the research field including Information Technology and IT implementation strategies through a literature review". To achieve this objective, a critical literature review was conducted. The literature review covered issues relating to IT implementation strategies' expansion processes, these being the concepts and motivation for international expansion which included organisation critical area in Information System IS, organisational, legal, financial and socio-cultural factors. Information gained through the literature review also assisted the researcher in developing the conceptual and methodological aspects of the data gathering process. Hence, the first objective was successfully achieved.

The second objective was "To investigate selected airports in Libya as case study in terms of how successfully Information Technology is being dealt with". In order to achieve this objective, an essential review of the issues relevant to the Libyan business environment generally, and of the issues relating to IT implementation in particular, was conducted and presented in Chapter 3. It

focused on the economic developments that have taken place in Libya, on the business laws and regulations concerning aviation activities generally, and on airport IT implementation strategies in particular. It also focused on the incentives and guarantees that could be provided by the government to the Libyan CAA that might assist in expanding their activities into most Libyan airports. In other words, comprehensive background investigations were undertaken looking at government polices (by using the various documents and archival materials gathered from the relevant authorities) towards the Libyan CAA that might encourage them to enter the rest of the Libyan airports. Thus, this objective was fruitfully achieved.

The third objective was "To determine the requirements and needs of an IT implementation strategy especially in critical area in order to encourage the Libyan CAA (the owners of most of the civil airports in Libya) expand their activities into other Libyan airports ". In order to satisfy this objective, two case studies were conducted into Libyan airports to gather the relevant and required information about IT systems' expansion plans in terms of the requirements and needs. This was explored with the intention of expanding good practice activities into Libyan aviation generally and into Libyan airports information was gathered via a questionnaire and interviews. The questionnaire and the interview guidelines (See Appendices Nos. 1, 3 and 5) were designed following on from, and based upon, the research aims/objectives and the relevant literature. The researcher employed two kinds of questionnaire survey:

- A questionnaire completed by airport employees having medium and low levels of responsibility (see Sections 5.2.4).
- A questionnaire completed by passengers. (see Sections 5.2.6)

Thereafter, an analysis (using a narrative technique to present it in a meaningful form (Chapter 6) was undertaken both the data from the questionnaires and from the interviews. The collected data from the case study organisations were categorised and then developed into large matrices (Section 6.2). Data obtained from the interviews were also analysed using a narrative technique to present them in a meaningful form. Hence, an exploration was undertaken to ascertain the requirements and needs of IT implementation in order

to encourage the Libyan CAA to expand their activities into other Libyan airports, thereby securing the third objective.

The fourth objective was "To propose a hypothetical IT Implementation framework for Libyan airports, based on the evaluation and assessment of data from objective 2". In order to gain a wider and in-depth understanding of the benefits that Libya may obtain in this area, a literature review was conducted and appropriate information was gathered from the case study organisations. The study findings presented several advantages that the Libyan CAA could gain from the IT Implementation strategy framework, as presented in Chapter 7. Therefore, the fourth objective was successfully achieved.

The fifth objective was "Draw conclusions and provide recommendations for its use" to make and provide recommendations for the Libyan decision makers (Libyan CAA) to use as a guideline to encourage airports to expand their activities into information technology". To achieve this objective, the findings derived from the previous objectives were discussed successfully using a compare and contrast approach with the findings in the literature "which have been updated and scrutinised" in order to gain a wider and in-depth understanding of the key factors that will encourage the Libyan CAA (within the case study organisations) to expand their activities into all Libyan airports. Recommendations for Libyan decision-makers were made and provided in Chapter 8 in order to encourage the Libyan CAA, through their airports, to expand their activities within the area of information technology.

The following section provides a summary of the main recommendations.

Finally, by meeting the five research objectives, the main research aim was achieved by establishing the key factors that will encourage the Libyan CAA to expand their activities within Libyan airports. Hence, the main research questions were also answered.

8.3 Main Conclusions and Findings

The main conclusions from this research are as follows:

- The application of IT is expected to create a positive value within organisations;

- The field of IT is still inconclusive , especially in critical area in guiding the implementation of ITS in organisations;
- Many of the existing rules, frameworks and methodologies do not adequately address all the requirements needed for effective IT implementation and do not provide sufficient detailed information;

➢ The following areas were found to affect the successful implementation of ITS:

- Organisational culture;
- The existence and usage of IT;
- Technology transfer;
- Employees' requirements;
- Training and learning;
- IT resources, IT strategy, IT skills and IT staff;
- Knowledge transfer;
- Management departments;
- Organisational structure, and
- Organisational policy and procedures.

The results highlighted that Libyan airports cannot fully exploit the benefits generated by an ITS because of the difficulties that these airports face in building and exploiting IT systems, procedures, structures, etc.

There is a need for a tool that can assist senior managers in these airports in implementing a successful ITS. Research can provide viable information technology requirements for developing IT implementation within Libyan airports.

Considering the need to assist managers, this work provides a set of factors to justify how ITS can be implemented within organizations, as it demonstrates the key factors that affect the implementation of IT. Furthermore, this research identifies mechanisms to incorporate human and IT values in order to improve ITS implementations, and to leverage competence. Finally, this research discussed the

implications of ITS within Libyan airports organisation and recommends future research.

This study provides the following outcomes?:

Clarification: The research identifies a successful framework for IT implementation strategies successful parts of an IT implementation strategy within Libyan airports.

Effectiveness: Identification of the barriers to, and the promotional factors for, IT implementation within Libyan airports.

Efficiency: The process structure shown in this study may improve IT implementation outcomes.

8.4 Recommendations

There are many benefits that Libya may obtain from the involvement of information technology in the country. Therefore, the government should concentrate its efforts on encouraging the Libyan CAA, through their airports, to expand their activities in the field of information technology. In order to achieve this goal, Libyan policy makers should take into account the IT implementation strategy (and its requirements and needs) which is discussed and presented in this study. In addition to the comprehensive framework presented in Chapter 7 (on the requirement and need for the Libyan CAA, through their airports, to expand their activities in the information technology field in order to encourage them to expand their activities into Libyan aviation generally, and into Libyan airports in particular), the following points summarise the main recommendations made to the decision-makers in Libyan airports in order to foster the establishment of activities encouraging information technology in Libyan airports.

- The Libyan CAA should take into consideration the key factors that influence an information technology implementation strategy to move into Libyan airports for its value.
- The Libyan CAA should invest in promoting the country's business environment in the world generally, should also promote the country as an international tourist destination and should concentrate on the information technology that is needed by Libyan airports as is illustrated in this study.

- The Libyan government, through the Libyan CAA, should encourage its employees to recognize and respect any implementation of technology within systems. This should include training local people to work in different departments and encouraging the recognition of IT system in order to understand their needs.

- The Libyan authorities should concentrate their effort initially on attracting quality fast and easy services to assist in IT systems' implementation within airports to ease and smooth the flow of employees and passengers.

- Protection of the Libyan natural environment: the development of IT implementation in the airports and airports' infrastructure should not jeopardise the natural environment but rather it should integrate the preservation of the natural environment within such development.

- The Libyan government should ensure freedom of transfer for foreign companies' profits from Libya to those companies' home countries. The stability of currency exchange is also important in order to encourage foreign companies to make positive investment decisions concerning Libya, especially in the technology sector.

- The Libyan CAA (Libyan decision-makers within the CAA) should take into consideration the nature of airport business activities and the ways of operating their businesses. For example, most airports in Libya adopt a small amount of technology in order to assist with expansion rather than utilising large amounts of technology in order to obtain other objectives. Therefore, the authorities should allow foreign organisations involved in the IT field in order to encourage them to expand their activities into Libyan airports. The Libyan authorities should be more flexible in its policy regarding the labour market by removing any restrictions that prevent IT implementation organisations from operating their business activities successfully. Although the Libyan government has established and promulgated several laws and resolutions to encourage foreign IT companies to enter the Libyan market, the application of these laws and resolutions have not been fully implemented and thus this does not cause the foreign IT companies to feel that Libya is serious in its desire to attract

foreign companies. Therefore, Libya should activate these regulations efficiently and put them into practice.

8.5 Major contributions to Technology Knowledge

This study provides significant original contributions to Information Technology IT, Information System IS and Technology knowledge at both academic and practical levels. The following are the main contributions made by this research:

- This study is considered as a first step towards theory building relating to ITS implementation into Libyan airports. It has brought together a large body of technology knowledge on the requirements and needs of ITS in order to encourage local and foreign technology companies to expand their activities into Libyan airports. Additionally, it stresses the need for quality fast and easy services for IT systems' implementation within Libyan airports in order to ease communications between all departments and to ease and improve the flow for to assist employees' work and the flow of passengers through the airports.

- The review of the literature has revealed a large gap and the need for more research, and this study has made a contribution in this respect.

- This study contributes to the limited literature on IT implementation strategies with respect to the existing policies that are adopted by the Libyan CAA.

- This study has uncovered many new ideas and issues that could be considered for further studies.

- This research makes significant recommendations to the decision-makers both within the Libyan CAA and within the Libyan Airports' authorities who should be encouraged to implement ITS within the airports. These recommendations could be used as guidelines in formulating the right

policies in order to encourage the Libyan CAA to expand their activities into all Libyan airports.

- It is recognised that this study has some limitations, but it is believed that the findings of this study provide a deep understanding of the requirements and needs of IT implementation in order for the CAA to expand their activities into all Libyan airports. It also provides a starting point for future research.

8.6 Suggestions and Further Research

The exploratory research into two Libyan airports has provided a holistic examination of airport employees having medium and low levels of responsibility and of senior staff, namely IT- and non-IT managers, through discussions which presented qualitative and quantitative data and which raised a number of questions The exploration of this information was undertaken in order to enhance the successful implementation of an ITS. On the basis of the findings and conclusions of this study, the researcher can suggest several other research directions that could be followed in the future, such as:

- This study revealed that there is no clear image of Libyan airports within the world in general and further research is recommended to investigate how to promote Libyan airports in the world in terms of the country's business environment and promoting them as an international aviation destination.

- This research could be replicated with similar organisations (airports) in different Arab or African countries that lack utilisation of such IT implantation schemes. Further research could be undertaken in order to enhance the understanding of how to attract and encourage other airports to expand their activities in the IT field.

- Research is needed to understand and investigate how to co-ordinate and to generate cooperation between the airports in Libya in order to achieve maximum utilisation of IT implementation strategies.

Although this study has identified advantages that could be obtained from the setting up of an IT implementation strategy in the Libyan airports' sector in general and in Tripoli and Benghazi airports in particular?, negative aspects could occur as

a result of such an implementation. Therefore, further research could be conducted in this area to identify the related issues and to find ways to overcome these issues.

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The appendix

Appendix 01

The interview Question In English

Recently I have been busy with customers for implementation of a Collaboration solution. I have met few business users and asked about their thoughts on the solution. While working I have prepared a list of questionnaire to talk to the IT Workers (Face to Face) Interview. This question helped me a lot knowing their ideas and concentrating on the features that I should implement in the initial deployment. I am sharing the questions here which may be helpful for IT and Implementation experts.

Question (Interview)

1. What is your Name?
2. What is your Position in the Organization?
3. How old are you?
4. What is your daily routine at Work?
5. How do you categorize your activities or projects?
6. What is the best part of your job?
7. What is Collaboration for you?
8. Are you ready for the change? Why?
9. What is the toughest part/frustration of your Job?
10. What is the least good part of your job?
11. Where do you store your project documents personally?
12. Please show me your central repository!
13. Do you want multilingual site?
14. How often you do meetings with your peers?
15. Do you take meeting notes?
16. How do you talk to people in the other deportment?
17. Which business processes you should or could be improved?
18. What kind of training you like `Presentation or Hands on' do like to see Video based training?
19. What is your IT Strategy Implementation vision? Please describe this in as much detail as possible.
20. What are the barriers of IT Strategy implementation in the airport?
21. What are the effective factors to implement the IT in the airport
22. Do you have any IT Strategy implementations plan for the new Project (New Airport)

23. What is your technology vision? Please describe this in as much detail as possible.

24. What are the overall benefits to the company in adopting IT Strategy Implementation?

25. What technology improvements have been identified or are currently in progress?

26. What is your current level of IT user satisfaction?

27. Who are your key users? (Departments/Business Units)

28. Who are your key technology suppliers at this time?

29. What are the key applications that would provide the most impact if they were improved significantly?

30. What applications have you identified that could most benefited from enabling technologies?

31. Will you please talk about the most important issues to (name five or more) improve the IT system in this airport and any suggestions on what improvements could be made

1. _____2. _____

3. _____4. _____

5. _____

Thank you very much; your response is highly appreciated.

Abdulhakim El Sab

Appendix 02

Covering Letter sent with the questionnaire and interview.

Dear Sir or Madam:

Title & E-mail	
Name	
Position	
Organisation/Place of Work	
Date	

Subject: Survey

I am presently preparing a thesis on the Strategically Framework for Information Technology Implementation in Libyan Airports as part of my M Phil Degree at The University of Salford School of Built Environment The Research Institute for the Built and Human Environment.

An important element of the thesis is to carry out a field survey to assess and improve the IT Strategy Implementation in Libyan airports.

Enclosed please find a questionnaire, and based on your experience as a professional in the field of IT, I kindly asking you to spare part of your valuable time to fill it in. Please note that your name and your company or department name will remain confidential as far as the results are concerned.

The collected data will be statistically analysed, and a conclusion will be finalised. If you wish, I shall be happy to provide you with the results of the study once finished.

Your assistance and cooperation will be highly appreciated.

Thank you

Abdulhakim El Sabu

Appendix 03

Questionnaire Form for Low & medium employees at both airports.

Please respond to the following questions either by ticking the appropriate box or by writing your answer in the space provided.

A part of the dissertation research for M Phil theses Strategically Framework for Information Technology Implementation in Libyan Airports,

by: Abdulhakim El Sabu

A comparative study of IT Strategy Implementation in Libyan Airports

Please note:

• The answers should be based on your experience in Information Technology.

• All information provided will be treated in the strictest of confidence.

Section 1: – *General Information*.

1- Are you officially designated as the top IT leader of the Airport?

- ☐ No
- ☐ Yes

2- To which position(s) does the top IT leader in the Airport report? Check all that apply

- ☐ Secretary of the People's Committee of the Airport.
- ☐ Vice of Secretary of the People's Committee of the Airport.
- ☐ Chief administrative officer.
- ☐ Executive Director of IT.
- ☐ Director of IT.
- ☐ Director of IT Planning.
- ☐ Chief financial officer.
- ☐ Executive VP/COO.

☐ General Director.

☐ Other. Describe "other" (optional).

3- How did you find the IT system in the Airport?

☐ Poor

☐ Good

☐ Very good

☐ Excellent

4- What is/are the size of IT system in the Airport ?

☐ Very large

☐ Large

☐ Medium

☐ Small

5- Which statement best characterizes your institution's current attitude toward IT Strategy Implementation?

☐ IT Strategy Implementation framework is an important activity that is closely linked to the budget

allocation process.

☐ IT Strategy Implementation framework is an important activity but it is not closely linked to the budget allocation process.

☐ The Airport does not place much emphasis on any IT Strategy Implementation framework.

6- Which statement best characterizes the organizational climate of the Airport?

☐ Stable

- [ ] Dynamic
- [ ] Volatile

7- When did your institution complete its most recent IT strategic implementation effort?

- [ ] 2009
- [ ] 2010
- [ ] 2011
- [ ] Prior to 2007

8- How does your IT department at the Airport communicate its PRIORITIES and PERFORMANCE? Check the top three approaches. [3 responses]

- [ ] Focus groups
- [ ] Regularly scheduled meetings
- [ ] Performance dashboards
- [ ] Videos
- [ ] Annual reports
- [ ] A balanced scorecard
- [ ] Newsletters
- [ ] Press releases
- [ ] Other

9- How frequently does your IT organization report on the progress of goals that are stated in IT plans?

- [ ] Monthly

- ☐ Every two months
- ☐ Quarterly
- ☐ Semi-annually
- ☐ Annually
- ☐ Never
- ☐ Other

10- Why does IT measure? Please check the top three reasons. [3 responses]

- ☐ To compare our performance with past years' performance
- ☐ To educate IT staff about service level responsibilities
- ☐ To secure financial and other resources
- ☐ To inform decisions about new services
- ☐ To improve communications with users
- ☐ To identify internal improvement opportunities
- ☐ To increase top management support
- ☐ To fulfill an administrative mandate for measuring
- ☐ To establish the progress towards achieving our goals

Evaluation of IT as whole

Figure the following causes regarding to their frequency and Importantly weight. The range of weighting in the research survey will be CLICKED AS WHAT YOU ARE THINGING IS RIGHT.

Frequency	Important
Never.	No effect
Occasionally	Fairly Important
Frequently	Important
Constantly	Very Important

Evaluating Achievement of IT Priorities and Using Measurements to Inform IT Priority-Setting

Please state your opinions on the following statements.

1, Shortage of manpower (skilled, semi-skilled, unskilled Labour)

Frequency	Important
☐ Never	☐ No effect
☐ Occasionally	☐ Fairly Important
☐ Frequently	☐ Important
☐ Constantly	☐ Very Important

2. Implementation of IT initiatives is guided by a formal, institutional priority-setting process.

Frequency	Important
☐ Never	☐ No effect
☐ Occasionally	☐ Fairly Important
☐ Frequently	☐ Important
☐ Constantly	☐ Very Important

3. IT implementation framework includes resource requirements.

Frequency	Important
☐ Never	☐ No effect
☐ Occasionally	☐ Fairly Important
☐ Frequently	☐ Important
☐ Constantly	☐ Very Important

4. IT implementation framework specifies metrics (measures) for evaluation outcomes.

Frequency	Important
☐ Never	☐ No effect
☐ Occasionally	☐ Fairly Important
☐ Frequently	☐ Important
☐ Constantly	☐ Very Important

5. The Airport publishes performance expectations for network reliability.

Frequency	Important
☐ Never	☐ No effect
☐ Occasionally	☐ Fairly Important
☐ Frequently	☐ Important
☐ Constantly	☐ Very Important

6. The Airport publishes performance expectations for other IT services..

Frequency	Important
☐ Never	☐ No effect
☐ Occasionally	☐ Fairly Important
☐ Frequently	☐ Important
☐ Constantly	☐ Very Important

7. The Airport's IT priorities are well understood.

Frequency	Important

☐	Never	☐	No effect
☐	Occasionally	☐	Fairly Important
☐	Frequently	☐	Important
☐	Constantly	☐	Very Important

8. Lack of motivation among IT's members.

Frequency		Important	
☐	Never	☐	No effect
☐	Occasionally	☐	Fairly Important
☐	Frequently	☐	Important
☐	Constantly	☐	Very Important

9. Shortage of technical professionals in the organization.

Frequency		Important	
☐	Never	☐	No effect
☐	Occasionally	☐	Fairly Important
☐	Frequently	☐	Important
☐	Constantly	☐	Very Important

10. Poor communications by the department with the parties involved in the project.

Frequency		Important	
☐	Never	☐	No effect
☐	Occasionally	☐	Fairly Important

☐ Frequently ☐ Important

☐ Constantly ☐ Very Important

11. How could the potential of IT be realised to improve business performance in the Airport.

Frequency Important

☐ Never ☐ No effect

☐ Occasionally ☐ Fairly Important

☐ Frequently ☐ Important

☐ Constantly ☐ Very Important

12. Inefficient quality control by the department.

Frequency Important

☐ Never ☐ No effect

☐ Occasionally ☐ Fairly Important

☐ Frequently ☐ Important

☐ Constantly ☐ Very Important

13. IT management respond.

Frequency Important

☐ Never ☐ No effect

☐ Occasionally ☐ Fairly Important

☐ Frequently ☐ Important

☐ Constantly ☐ Very Important

14. Senior leaders at the airport regularly consider the IT implications of institutional decisions

Frequency	Important
☐ Never	☐ No effect
☐ Occasionally	☐ Fairly Important
☐ Frequently	☐ Important
☐ Constantly	☐ Very Important

Materials & Equipment

15. Shortage of required equipment.

Frequency	Important
☐ Never	☐ No effect
☐ Occasionally	☐ Fairly Important
☐ Frequently	☐ Important
☐ Constantly	☐ Very Important

15. Shortage of required equipment.

Frequency	Important
☐ Never	☐ No effect
☐ Occasionally	☐ Fairly Important

☐ Frequently ☐ Important

☐ Constantly ☐ Very Important

16. Difficulties in financing the project by the department.

Frequency Important

☐ Never ☐ No effect

☐ Occasionally ☐ Fairly Important

☐ Frequently ☐ Important

☐ Constantly ☐ Very Important

21-41. Cash flow problems faced by the Organisation.

Frequency Important

☐ Never ☐ No effect

☐ Occasionally ☐ Fairly Important

☐ Frequently ☐ Important

☐ Constantly ☐ Very Important

Does your central IT department at the Airport regularly analyze its performance using the following methodologies?

17. Performance metrics.

Frequency Important

☐ Never ☐ No effect

☐ Occasionally ☐ Fairly Important

☐ Frequently ☐ Important

☐	Constantly	☐	Very Important

18. Self-assessment.

Frequency		Important	
☐	Never	☐	No effect
☐	Occasionally	☐	Fairly Important
☐	Frequently	☐	Important
☐	Constantly	☐	Very Important

19. Outside assessment.

Frequency		Important	
☐	Never	☐	No effect
☐	Occasionally	☐	Fairly Important
☐	Frequently	☐	Important
☐	Constantly	☐	Very Important

IT Impact.

State your opinion about the impact that IT planning had on the following.

20. Orienting a new leader to the state of IT at the institution.

Frequency		Important	
☐	Never	☐	No effect
☐	Occasionally	☐	Fairly Important
☐	Frequently	☐	Important

☐ Constantly ☐ Very Important

21. Increasing top management support.

Frequency Important

☐ Never ☐ No effect

☐ Occasionally ☐ Fairly Important

☐ Frequently ☐ Important

☐ Constantly ☐ Very Important

Please tell us how often your IT department at the Airport seeks input from the following.

22. Passengers satisfaction surveys.

Frequency Important

☐ Never ☐ No effect

☐ Occasionally ☐ Fairly Important

☐ Frequently ☐ Important

☐ Constantly ☐ Very Important

23. Formal meetings.

Frequency Important

☐ Never ☐ No effect

☐ Occasionally ☐ Fairly Important

☐ Frequently ☐ Important

☐ Constantly ☐ Very Important

24. In-service training sessions.

Frequency Important

☐ Never ☐ No effect

☐ Occasionally ☐ Fairly Important

☐ Frequently ☐ Important

☐ Constantly ☐ Very Important

25. Secretary of the People's Committee of the Airport..

Frequency Important

☐ Never ☐ No effect

☐ Occasionally ☐ Fairly Important

☐ Frequently ☐ Important

☐ Constantly ☐ Very Important

26. Chief administrative officer.

Frequency Important

☐ Never ☐ No effect

☐ Occasionally ☐ Fairly Important

☐ Frequently ☐ Important

☐ Constantly ☐ Very Important

27. General Director.

Frequency Important

☐ Never ☐ No effect

☐ Occasionally ☐ Fairly Important

☐ Frequently ☐ Important

☐ Constantly ☐ Very Important

28. IT members

Frequency Important

☐ Never ☐ No effect

☐ Occasionally ☐ Fairly Important

☐ Frequently ☐ Important

☐ Constantly ☐ Very Important

29. Poor qualification of IT consultant engineer's staff assigned to in the Airport.

Frequency Important

☐ Never ☐ No effect

☐ Occasionally ☐ Fairly Important

☐ Frequently ☐ Important

☐ Constantly ☐ Very Important

30. Delay in IT management consultation.

Frequency Important

☐ Never ☐ No effect

☐ Occasionally ☐ Fairly Important

☐ Frequently ☐ Important

☐ Constantly ☐ Very Important

31. Poor communication between the IT consultant engineers and other parties involved within Airport.

Frequency Important

- ☐ Never ☐ No effect
- ☐ Occasionally ☐ Fairly Important
- ☐ Frequently ☐ Important
- ☐ Constantly ☐ Very Important

23. Poor IT contract management.

Frequency Important

- ☐ Never ☐ No effect
- ☐ Occasionally ☐ Fairly Important
- ☐ Frequently ☐ Important
- ☐ Constantly ☐ Very Important

33. Slow decision making by the organisation.

Frequency Important

- ☐ Never ☐ No effect
- ☐ Occasionally ☐ Fairly Important
- ☐ Frequently ☐ Important
- ☐ Constantly ☐ Very Important

CAA Regulations

34. Difficulties in obtaining work permits.

Frequency Important

- ☐ Never ☐ No effect

☐ Occasionally ☐ Fairly Important

☐ Frequently ☐ Important

☐ Constantly ☐ Very Important

35. Changes in government regulations and laws.

Frequency Important

☐ Never ☐ No effect

☐ Occasionally ☐ Fairly Important

☐ Frequently ☐ Important

☐ Constantly ☐ Very Important

External Factors

36. Severe problem conditions on the job site.

Frequency Important

☐ Never ☐ No effect

☐ Occasionally ☐ Fairly Important

☐ Frequently ☐ Important

☐ Constantly ☐ Very Important

37. Effects of social and cultural conditions for IT Implementation.

Frequency Important

☐ Never ☐ No effect

☐ Occasionally ☐ Fairly Important

☐ Frequently ☐ Important

☐ Constantly ☐ Very Important

38. Work interference between various levels of Management.

Frequency Important

☐ Never ☐ No effect

☐ Occasionally ☐ Fairly Important

☐ Frequently ☐ Important

☐ Constantly ☐ Very Important

Appendix 04
Letter sent with the Interview

Dear senior-Managers

1- Tripoli International Airport _ Libya
2- Benghazi Airport _ Libya

My name is Abdulhakim A. El Sabu M Phil student 2nd year at University of Salford.

I am here asking you very kindly to help me in answering some of my M phil Question face to face as interview on improving and development the IT Implementation Strategy Framework in Libyan Airports,

The reason for this interview is to support the research findings and to broaden my knowledge on this topic, as a interview has become imperative way of collecting data.

All I need is to spare 30 to 45 minutes from your valuable time to have interview with you at any convenient time to you.

For any further information please do not hesitate to contact me on +218(0)927736310 in Libya and/or +44(0)7894213860 in the UK. Or alternatively contact me at my e-mail sabu962000@yahoo.com.

Many thanks to you and I appreciate your efforts to help me in this research.

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Appendix 05

Questionnaire Form Passenger satisfaction survey

Please respond to the following questions either by ticking the appropriate box or by writing your answer in the space provided.

A part of the dissertation research for M Phil theses Strategic Framework for Information Technology Implementation in Libyan Airports' By: Abdulhakim El Sabu

A comparative study of IT Strategy Implementation in Libyan Airports

Please note:

• The answers should be based on your experience.

• All information provided will be treated in the strictest of confidence.

1- Where are you coming from?

☐ Africa

☐ Middle East

- ☐ Far East
- ☐ Europe
- ☐ USA
- ☐ Other

2- Have you flow through this airport before?

- ☐ No
- ☐ Yes

3- How often do you travel before?

- ☐ Once
- ☐ Twice
- ☐ More than three times
- ☐ More than seven times

4- How frequently you travel through this airport

- ☐ Once a year
- ☐ two to three times a year
- ☐ Three to Five times a year

5- Where are you going to?

- ☐ Africa
- ☐ Middle East
- ☐ Far East

- ☐ Europe
- ☐ USA
- ☐ Other

6- How do you find a check-in arrangements at this airport

- ☐ Poor
- ☐ Good
- ☐ Very good
- ☐ Excellent

7- How did you find the IT system in this Airport?

- ☐ Poor
- ☐ Good
- ☐ Very good
- ☐ Excellent

8- What is/are the size of IT system in this Airport?

- ☐ Large
- ☐ Medium
- ☐ Small

9- How reliable is the electronic indicator and airport guidance system (electronic display boards on the information panel that display gate numbers and Departure times)

- ☐ Always
- ☐ Mostly
- ☐ Sometimes
- ☐ Never

10- Do they display accurate information?

- ☐ Always
- ☐ Mostly
- ☐ Sometimes
- ☐ Never

11- Are the announcements timely and clear?

- ☐ Always
- ☐ Mostly
- ☐ Sometimes
- ☐ Never

12- Departure from your boarding airport.

- ☐ Always on time
- ☐ Mostly on time
- ☐ Sometimes on time
- ☐ Never on time

13- How do you rate your overall experience of the services provided by airport on a scale of 1 to 10?

(1 is the lowest grade and 10 the highest grade).

1 2 3 4 5 6 7 8 9 10

14- How do you rate the value of services provided by the airlines for the price that you pay on a scale of 1 to 10?

(1 is the lowest grade and 10 the highest grade).

1 2 3 4 5 6 7 8 9 10

15- Do you feel that updated/accurate flight information is transmitted?

- Always
- Mostly
- Sometimes
- Never
- Can't say

16- Are you able to freely access the internet/web based enquiry service at the airport?

- Always
- Mostly
- Sometimes
- Never
- Can't say

17- Which statement best characterizes the organizational climate of this Airport?

- ☐ Stable
- ☐ Dynamic
- ☐ Volatile
- ☐ Turbulent

18- Are institutional IT priorities tied to this Airport budgetary procedure?

- ☐ No
- ☐ Yes

19- May I contact you to obtain further insights or clarification on your responses?

- ☐ No
- ☐ Yes

20- Do you wish to receive a copy of the key findings from this study?

- ☐ No
- ☐ Yes

Thank you very much; your response is highly appreciated.

Abdulhakim El Sabu

Appendix 06

The Questions of the Framework Validation

Please rate the following questions relating to the ITIFLA framework whereas 1=totally disagree and 5=extremely agree

1-Overall Framework

Component	1	2	3	4	5
Evaluation step	®	®	®	®	®
Evaluation component	®	®	®	®	®
Adoptability (Could be implemented)	®	®	®	®	®
Reliability (Could have results)	®	®	®	®	®

2-The Framework Step One

Component	1	2	3	4	5
Glossary of terms	®	®	®	®	®
Linking IT to strategic goals and objectives	®	®	®	®	®
Strategic context	®	®	®	®	®
Place the business changes	®	®	®	®	®
Implications for the organizational knowledge base	®	®	®	®	®

3- The Framework Step Two

Component	1	2	3	4	5
Monitoring IT strategy	®	®	®	®	®
Level of organizational readiness	®	®	®	®	®
Determine of IT tools	®	®	®	®	®
IT clarification process	®	®	®	®	®

4- The Framework Step Three

Component	1	2	3	4	5
Identification of IT plan	®	®	®	®	®
Links IT and change management	®	®	®	®	®
IT impact on the system	®	®	®	®	®
Implications of IT processes	®	®	®	®	®

5- The Framework Step Four

Component	1	2	3	4	5
Providing Formal mechanisms for IT	®	®	®	®	®
Integrated IT in business processes	®	®	®	®	®
Exploiting IT tools and technologies	®	®	®	®	®
Increase interactions amongst staff	®	®	®	®	®

6- The Framework Step Five

Component	1	2	3	4	5
Constant improvements in IT infrastructures	®	®	®	®	®
Embraces innovations through ITS results	®	®	®	®	®
Benefiting from IT technologies and tools	®	®	®	®	®
Providing technology on time, with quantity and quality	®	®	®	®	®